BRITISH MEDICAL JOURNAL

LONDON SATURDAY MAY 23 1942

RESPIRATOR DERMATITIS

BY

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War conditions have recently brought to light a form of rubber dermatitis due to the wearing of certain types of Service respirator. Rubber dermatitis, a variety of dermatitis venenata, is well known to occur as an occupational disease in the rubber industry and in predisposed subjects whose skin comes into close and repeated contact with articles made of some forms of rubber. An example of the latter group is a dermatitis of the hands which occurs among members of the medical and nursing professions and results from the frequent wearing of rubber gloves. Among other rubber utilities responsible are adhesive plasters, bunion protectors, and axillary shields, the latter worn by women for the protection of clothes against stains from perspiration. Less well known is a dermatitis of the penis from the use of rubber contraceptive sheaths.

The term "rubber dermatitis" is misleading, because rubber itself is not the allergen responsible for the sensitization phenomena in susceptible subjects, but becomes such in the process of cure and vulcanization in which substances known as "accelerators" and "anti-oxidants" are used. Many such chemical compounds are employed, and while some are innocuous others act as irritants. Among the better-known "accelerators" and "anti-oxidants" are phenyl-beta-naphthylamine, tetramethyl-thiuram-mono- (or) di-sulphide, guanidines, and mercaptobenzothiazole (Schwartz and Tulipan, *Occupational Diseases of the Skin*, p. 383, 1939); also hexamethylenetetramine, known as "hex,"' and the butylaldehyde concentration product of dimethyl-*p*-phenylenediamine referred to as "B.B." or "Montana syrup" (Goldsmith, *Recent Advances in Dermatology*, p. 461, 1936).

Observing these facts, and bearing in mind the generally accepted factors necessary for the production of a sensitization dermatitis—namely, predisposition, repeated exposure, and adequate concentration of an irritant—it was of considerable interest to note and investigate 16 cases of facial dermatitis which, while exhibiting some unusual and hitherto undescribed features, conformed in many respects to other varieties of sensitization dermatitis. These cases occurred among the personnel at one of the Royal Naval depots where regular weekly respirator drill had been carried out for many months.

The diagnosis of rubber dermatitis due to the wearing of masks made by a small number of firms was suspected on the grounds that: (i) the lesions showed a distribution which was mainly confined to areas of facial contact with the rubber facepieces; (ii) symptoms and signs manifested themselves either for the first time or, if already present, in an aggravated form on the day following respirator exercise; (iii) mild and evanescent symptoms, worse with each exercise, were admitted in retrospect by a number of patients; (iv) some cases followed a recent change in type of respirator; (v) the masks bearing embossed lettering of certain firms alone were found responsible for the dermatitis; (vi) patch tests with rubber disks cut from the patients' respirators and applied to their forearms showed positive reactions.

The diagnosis was confirmed by ascertaining the nature of all "accelerators" and "anti-oxidants" used in the manufacture of Service masks and by finding their respective irritant properties in tests on sensitized subjects and normal controls. This was done by differential patch-testing with specially prepared rubber disks which contained various "accelerators," "anti-oxidants," or mixtures of both in concentrations as used by the different manufacturers. Rubber not treated with these substances and tested in a similar manner gave negative results in all cases.

In this way it was possible to trace two offending substances, and their concentrations, which were responsible for the dermatitis. The types of mask owned by the 16 patients were all found to be of a manufacture in which one or other of these irritant compounds had been used. It is regretted that the exact composition of these "accelerators" and "anti-oxidants" cannot be divulged, apart from the fact that both are organic compounds, as no authority for this has been granted at present. The prime object of this article being the elucidation of the dermatology of a condition dependent on war conditions, it is hoped that the omission of the chemical formulae will be forgiven.

Further Aetiological Facts

It was observed that 3 to 15 exposures to potentially harmful masks for 15 minutes, at weekly intervals, were necessary for the production of sensitization in predisposed subjects.

It was impossible to assess the true incidence because of the constantly changing personnel of a Royal Naval depot—this entailing a loss in observation of men possibly in the process of acquiring sensitivity—and because of the resulting variation in numbers of potentially harmful masks worn during any one period.

The degree of perspiration, depending as it does on atmospheric temperature, humidity, exercise, diet, and individual variation, proved an important predisposing factor. This was partly borne out by the lowered incidence during a cold spell of weather and by a noticeable rise on the return of higher temperature. Two of the worst cases occurred in working stoker ratings, suggesting that high temperature and physical effort aggravated the condition.

No special characteristics were observed in the skin of the 16 patients—in contrast with general eczema, in which a dry or ichthyotic skin predisposes to attacks, and with arsenical dermatitis, more apt to develop in a seborrhoeic type of skin.

Symptoms and Signs

A mild burning sensation or an irritation was noticed in areas of contact with the mask, and occurred during or shortly after the third or later respirator exercise. The time of onset varied considerably, and some patients observed a transient erythema at the sites of irritation. These early symptoms became more pronounced with each fresh exposure of the face to the rubber mask, until the intense irritation, often associated with insomnia, and the developed inflammatory condition brought the patient to seek medical advice. Scratching was unavoidable in these circumstances, and gave rise to a pyogenic infection in a number of cases.

Distribution.—At first lesions were confined to areas of the face which come into close contact with the mask, affecting the frontal, malar, masseteric, mental, and submental regions. When confluent these had an appearance of an oval band of dermatitis surrounding a clear central portion of the face. In

FIG. 1 FIG. 2 FIG. 3

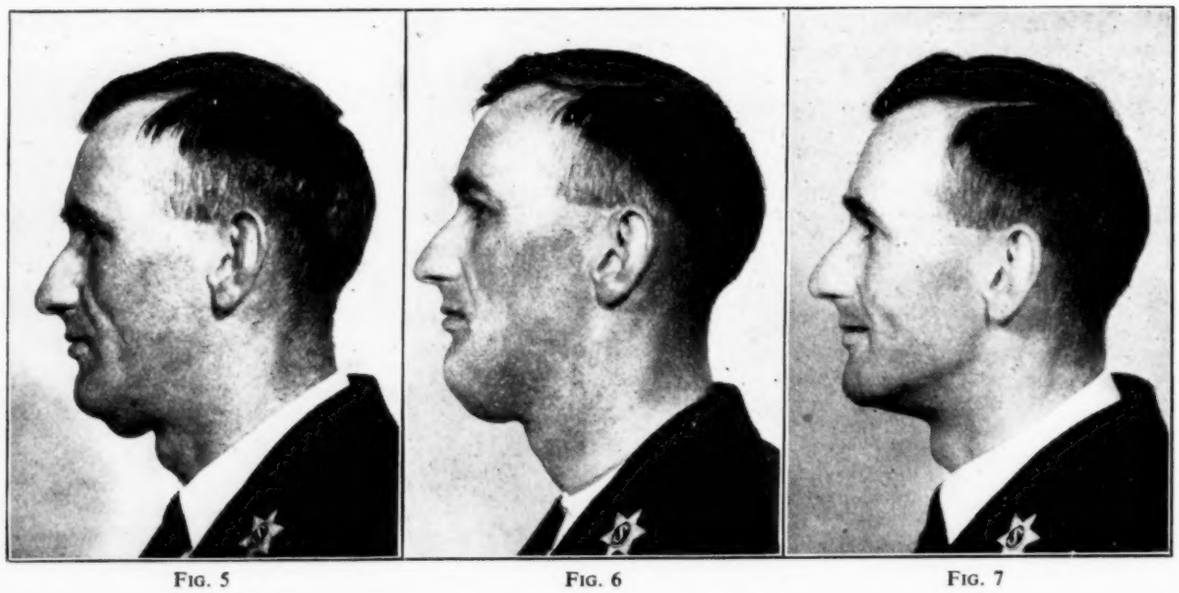

FIG. 5 FIG. 6 FIG. 7

FIG. 8 FIG. 9 FIG. 10

some patients, lesions were confined to one or more areas and, at first sight, bore a slight resemblance to patches of eczema, impetigo, or seborrhoeic dermatitis. An extension of lesions to the lax tissues round the eyes and in the submental region was later observed in some cases, appearing in the form of an oedema. In one highly sensitized patient a scaly erythematous dermatitis developed on the trunk and limbs.

Stages of the Dermatitis.—(1) The early stage of erythema was characterized by a somewhat sharply defined margin on the inner side of the oval inflammatory area, contrasting distinctly with the normal skin in the centre of the face. (2) The

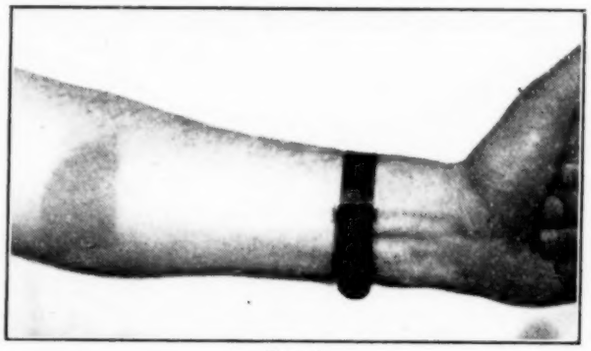

FIG. 4

later vesicular and weeping stages were similar to those seen in other forms of dermatitis, but differed in respect of the frequently associated oedema of the lax tissues, which gave an appearance of puffiness, double chin, and more advanced age than was consistent with the patient's years. Infection with pyogenic organisms was apt to occur at this period, and presented impetiginous characteristics with the onset of crusting. (3) A protracted dry and scaly stage followed the subsidence of the acute inflammatory phase, and it was at this period that great care had to be exercised in changing from bland to stronger applications. Relapse was more prone to occur than with other inflammatory skin conditions in a similar stage. (4) With gradual desquamation the affected areas became smooth, but retained some reddish discoloration for a few days. In one patient, however, such discoloration persisted for a period of three months.

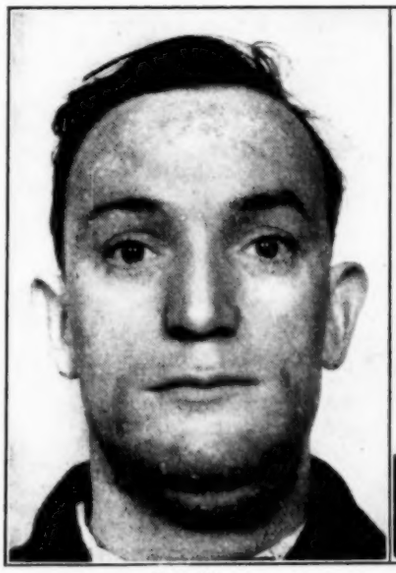

FIG. 11

FIG. 12

Complications

Deep-seated Submental Induration.—This occurred in 4 cases and followed the earlier submental oedema. It was characterized by a rapid extension of swelling in depth and on the surface, painlessness, and slight tenderness on palpation. The double-chin appearance of the early oedematous stage gave place to a large tense mass, which soon obliterated its discrete boundaries and extended to the lower border of the mandible above and to the upper border of the thyroid cartilage below, causing a temporary disappearance of the prominence known as "Adam's apple." The skin over the swelling became shiny, and palpation gave a sensation of marked induration comparable to that of diffuse and matted adenitis. In one patient this induration was accompanied by a cutaneous and subcutaneous oedema in the front of the neck which extended down to the sternal notch. He was "warded," as the possibility of respiratory interference could not be dismissed. This extension of oedema subsided in 24 hours, and was followed by a small fluctuating area in the centre of the submental swelling. Aspiration of this area yielded a blood-stained, sterile, and purulent fluid. While this complication suggested an infective basis, it occurred in cases without obvious skin infection. Some cases with marked impetiginous changes, on the other hand, failed to show even a mild submental oedema. An unseen crack in the skin was a possibility which could not be excluded, and if present may have provided a port of entry for bacteria, thus supporting an infective origin for the induration. Alternatively, the induration may have represented a deep-seated oedema dependent on the associated allergic phenomena and initiated by the action of substances also responsible for changes in the epidermis. A similar form of atopic reaction is seen side by side with minor inflammatory effects in susceptible individuals who use paraphenylenediamine hair-dye.

Palpebral Oedema.—The puffy appearance resulting from oedema of the lax tissues round the eyes was followed in one case by a more pronounced swelling of the lids, resulting in a "closed-eye" state which interfered with vision. No doubt this was another instance of allergic reaction.

Conjunctivitis.—A mild angular conjunctivitis was observed in 2 cases. In one it accompanied a severe dermatitis in the malar regions; in the other it occurred after the dermatitis had almost cleared up, and was confined to the outer canthus.

Prophylaxis and Treatment

The patch test gave positive results in susceptible subjects only when these had become sensitized; consequently it was

LEGENDS TO ILLUSTRATIONS

1. Note frontal, supra-orbital, malar, and mental distribution, and vesicular weeping and early crusting stages. No oedema or submental induration.
2. Same as Fig. 1, but different aspect. Note centre of face has escaped.
3. Normal of Figs. 1 and 2.
4. Positive patch-test reaction. Vesicular stage.
5. Note comparatively slight dermatitis in masseteric and mental regions, and the discrete submental oedema giving appearance of double chin. "Adam's apple" well marked. Compare with Figs. 6 and 7.
6. Advanced stage of Fig. 5. Erythema marked in masseteric area. Note extension of submental swelling illustrating submental induration, loss of contours seen in Fig. 5, oedema of anterior portion of neck with loss of prominence known as "Adam's apple," and apparent ageing. Compare with Figs. 5 and 7.
7. Normal of Figs. 5 and 6.
8. Severe case of respirator dermatitis. Note characteristic distribution, vesicular and early crusting stages, absence of submental oedema. Compare with the later stage, Fig. 9, and the normal appearance, Fig. 10.
9. Note advanced crusted stage, submental oedema with early induration, general puffiness, and apparent ageing. Compare with the earlier stage, Fig. 8, and the normal appearance, Fig. 10.
10. Normal of Figs. 8 and 9.
11. Note frontal, mental, and submental distribution, extent of submental induration giving the appearance of double chin, and general puffiness.
12. Normal of Fig. 11.

impossible to forecast susceptibility and to anticipate respirator dermatitis. In this way the simple procedure of assessing susceptibility in newly joined men was denied, and prophylaxis was confined to early diagnosis—i.e., observation of the initial and evanescent symptoms, and early patch-testing. The most effective prophylactic measure, entailing much labour, time, and untold difficulties, besides problems of rubber supply, is naturally the recall of all potentially harmful masks and their replacement by innocuous varieties.

Prompt treatment in the earliest stages ensured a rapid cure, while the replacement of the respirator by one of an innocuous variety prevented the recurrence of this condition. Patients presenting themselves in the later stages yielded to treatment in from two to three weeks.

The early stage of erythema with mild irritation responded to dusting with calamine powder or talc, no other treatment being necessary. A more pronounced erythema with considerable irritation necessitated calamine lotion or Burow's solution (a 2½% liq. aluminium acetate).

The outstanding application of value in the later stages of vesiculation, weeping, and crusting was calamine liniment. Lotions, pastes, and creams made up in simple form or with varied ingredients proved of doubtful value and sometimes harmful. Phenobarbitone, gr. 1 to 2, helped to control the intense irritation and the resulting insomnia. In superadded pyogenic infection a 20% sulphonamide paste proved useful in clearing up sepsis. The early submental oedema required no special treatment, but with the onset of induration compresses of cataplasma kaolini proved effective in controlling its extension and in promoting resolution. The case which developed a fluctuant area in the submental induration and showed cutaneous and subcutaneous oedema in the cervical region responded favourably to aspiration. The dry scaly stage proved the most resistant one, but responded to boric ointment cautiously followed by an ointment consisting of salicylic acid gr. 10, ammoniated mercury gr. 10, and paraffin. flav. molle to one ounce. The conjunctivitis was treated by bathing the eyes with a 2% boric lotion.

A review of the treatment shows that while no royal road to success has been discovered, attention to detail combined with appropriate choice of mild ingredients in a suitable base ensures the best results.

Summary

Respirator dermatitis—a form of rubber dermatitis—was observed in 16 patients.

Two organic substances belonging to a group of compounds known as "accelerators" and "anti-oxidants," and used in the vulcanizing of rubber masks, were found responsible for the skin changes.

The dermatitis was classed as one occurring in predisposed subjects, who at first tolerate the irritants, but later develop a sensitivity to them—in short, a sensitization dermatitis.

The points in favour of this classification are discussed.

Aetiology, symptoms, signs, complications, and treatment are described.

Photographs showing the normal and pathological appearance of patients are included.

Gratitude is expressed to Surg. Capt. G. V. Hobbs, R.N., for his encouragement of this investigation; to Surg. Cmdr. A. Fairley, R.N., and his colleagues for the preparation of the experimental rubber disks and technical information about respirator manufacture; and to Mr. A. Hornbrook for the photography of patients.

P. Levine and others (*Amer. J. Obstet. Gynec.*, 1941, **42**, 925) point out that erythroblastosis foetalis had been believed to result from antigen-antibody reaction on a purely theoretical basis before the part played in this condition by the Rh factor had been determined. The Rh factor in the foetal blood is transmitted as a dominant Mendelian gene from the father. Anti-Rh agglutinins have been demonstrated in the mother's blood, and the continuous action of these on the Rh-positive foetal blood over a period varying from weeks to months causes a progressive haemolysis of foetal blood. It is clear, then, that the immunizing substance can pass from the foetus to the mother through the placental barrier. As the Rh factor is probably limited to red blood corpuscles only, it is assumed that foetal blood in one form or another penetrates the villus in large enough quantity to immunize the mother.

TWO CASES OF REGIONAL ILEITIS (CROHN'S DISEASE)

BY

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Although scattered descriptions of this disorder are to be found in the medical literature previous to 1932, its clear recognition as a clinical entity dates from the publication of a paper by Crohn, Ginzburg, and Oppenheimer (1932). This paper was based on a series of 14 cases seen at the Mount Sinai Hospital, New York, and the disease has acquired the eponym "Crohn's disease." An extract from the original description will help to define the entity with which we are dealing:

"The disease is clinically featured by symptoms that resemble those of ulcerative colitis—namely, fever, diarrhoea, and emaciation—leading eventually to an obstruction of the small intestine, the constant occurrence of a mass in the right iliac fossa usually requiring surgical intervention (resection). The terminal ileum is alone involved. The process begins abruptly at, and involves, the ileo-caecal valve in its maximal intensity, tapering off gradually as it ascends the ileum orally for from 8 to 12 inches. The familiar fistulas lead usually to segments of the colon forming small tracts communicating with the lumen of the large intestine; occasionally the abdominal wall anteriorly is the site of one or more of these fistulous tracts.

"The aetiology of the process is unknown; it belongs to none of the categories of recognized granulomatous or accepted inflammatory groups. The course is relatively benign, all the patients who survive operation being alive and well."

Since 1932 it has become recognized that a similar non-specific inflammation may involve segments of the stomach, jejunum, ileum, and colon. The two cases described in this paper present some aspects of diagnosis and treatment.

Case I

The patient, an unmarried woman aged 22, was admitted to the Willesden General Hospital on July 14, 1941, having been diagnosed at another hospital as a probable case of Addison's disease. The onset of the illness was in Dec., 1940, the presenting feature then being diarrhoea. Some weeks later abdominal pain and vomiting were added. The pain first occurred in the epigastrium some 10 to 20 minutes after eating, but later in the illness it was more generalized, being felt all over the abdomen. Vomiting of bile or food slightly relieved the pain, which in any case disappeared after some 15 minutes. The pain was of a colicky character and often very severe. Diarrhoea was intermittent and would alternate with periods of constipation, which, however, did not obviate the pain. The patient became progressively weaker during the first half of 1941, and her weight fell from 9 st. 8 lb. to 6 st. 3 lb. The blood pressure was 95/60, and this, combined with some pigmentation over the abdomen and chest, suggested the diagnosis of Addison's disease, which appeared to be confirmed by chemical investigations carried out in May, 1941. Thus the serum sodium was said to be 270 mg. per 100 c.cm. (normal 320 mg.) and the chloride 545 mg. per 100 c.cm. (normal 560 to 620 mg.); the serum potassium was considerably raised, but it was recognized that the result was obviated by laking of the blood. In hospital (July 14, 1941) the serum sodium and chloride were found to be normal—330 mg. and 580 mg.; the fasting blood sugar low—65 mg. per 100 c.cm.; and the blood urea raised—60 mg. per 100 c.cm., the last-named probably associated with the existing dehydration. There were no special signs on physical examination, except some tenderness in the right iliac fossa. The temperature ranged between 98° and 102° F.; the pulse rate was about 96. Clinically the diagnosis of Addison's disease seemed improbable, and the therapeutic test of the daily injection of 20 mg. of desoxycorticosterone for 14 days was tried without any special improvement. (It is interesting that this high dosage did not produce oedema, as it might do in Addison's disease.) The sedimentation rate was raised—61 mm. in 2 hours—and a hypochromic microcytic anaemia was present: Hb 60%; erythrocytes 3,500,000 (average diameter

6.6 μ; C.I., 0.7; leucocytes, 10,000 per c.mm—polymorphonuclears 75%, eosinophils 4%, basophils 1%, lymphocytes 13%, and monocytes 7%. Examination of the stools revealed no pus cells or acid-fast bacilli; culture gave plentiful colonies of *B. coli* and a profuse growth of a non-haemolytic *Streptococcus faecalis*. Urine showed numerous oxalate crystals, but no other abnormalities and no acid-fast bacilli. The Mantoux test was positive, 1 in 1,000 dilution.

Radiological Investigation.—No evidence of any pulmonary lesion; no opaque gall-stones; no abdominal calcified glands; no calcification of suprarenal glands; no gastric lesion noted; appreciable pylorospasm and duodenal irritability and tenderness; barium enema: "The first evacuation studies are somewhat suggestive of a superficial colitis in the distal half of the colon."

The diagnosis appeared to be uncertain, but colitis and abdominal tuberculosis were thought of. This patient was seen by one of us (F. W. M. P.) on Aug. 7, when it was obvious that her condition was deteriorating. At that time she was having attacks of abdominal colic, although the abdomen was not distended. There was persistent slight tenderness in the right abdomen. It was considered that tabes mesenterica was the most probable source of her symptoms, and it was decided to conduct an exploratory laparotomy. The operation was performed on Aug. 19, under gas, oxygen, and ether, the abdomen being opened by a right paramedian incision. A typical condition of regional ileitis (Crohn's disease) in the acute stage was discovered. The terminal 15 inches of the ileum was swollen, red, and congested, but as yet quite free from adhesions to surrounding structures. As the patient's condition was not very good it was decided to limit operative intervention to a lateral anastomosis; consequently by this means a portion of healthy ileum was united to the transverse colon, but the terminal ileum was not excluded. The progress after operation was uneventful and the patient's condition showed considerable improvement. Her weight increased and the abdominal pains diminished in severity to a great extent, although they were not actually abolished. The sedimentation rate on Sept. 9 was still high—i.e., 1st hour, 42 mm.; 2nd hour, 47 mm.

The patient was allowed to leave the hospital on Sept. 16 for a short convalescence, and was readmitted on Oct. 6; by then her general condition had improved, but she had developed an ischio-rectal abscess. This was incised and drained, but the copious pus was found to be sterile.

At this time some abdominal pain was still present, usually occurring in the right iliac fossa at meal-times. There was also definite tenderness and guarding in the same area. A further laparotomy was performed on Oct. 24, when the terminal ileum was found to be in exactly the same condition as at the previous operation. The affected ileum and the ascending colon were resected. Progress was relatively uneventful, and a radical cure of the fistula in ano was performed on Nov. 21. The sedimentation rate on Nov. 17 was 84 mm. in 2 hours, and on Dec. 11 38 mm. in 2 hours. The patient was discharged very well and free from pain on Dec. 21. Recent communication has been received to the effect that she is very well and has regained weight and strength, but some frequency of stools persists.

Pathological Report

"(1) *Macroscopic:* Approximately 28.5 cm. of ileum and 20.5 cm. of caecum and ascending colon. Ileum forming a U-shaped loop, the two arms about 6 cm. up being joined by fibrous adhesions. Proximal 4 cm. of ileum appears free from disease—beyond this, wall much thickened, mucosa ulcerated, and serous surface rough and deep purple in colour. The ulceration stops at the ileo-caecal valves, but serosa of lowest part of caecum similar to that of ileum and wall thick; ascending colon dilated; mesentery very thick, with numerous enlarged glands. (2) *Microscopical:* Regional ileitis. In addition to the more chronic inflammatory changes there are miliary abscesses in submucosa and mucosa of ileum and caecum. The circular muscle fibres in ileum show fragmentation, and there is oedema of serosa. Chronic inflammation of lymphatic glands. (3) *Skin:* Acute inflammation of granulation tissue in scar with thick purulent exudate."

Case II

The patient, a girl aged 18, was admitted to the Willesden General Hospital on Sept. 5, 1941. She was first seen in the out-patient department in Dec., 1940, but was then unwilling to enter hospital for investigation. There had been loss of weight and anorexia for a year, amenorrhoea for 3 months, pain in the umbilical region for 2 months—the pain occurring during a meal but disappearing in 5 minutes—and alternating diarrhoea and constipation for some months. The only abnormal physical signs at the time were pallor of the mucous membranes and slight tenderness over the right upper rectus. There was a history of similar trouble at the age of 11, the symptoms lasting for several months. The following is a report from Dr. H. R. Hayes, medical registrar of St. George's Hospital, London, as to the findings at that time: "This patient was admitted on Dec. 12, 1934, with a history of loss of weight and having eaten very little for the previous 4 months. On examination she was very wasted and had a pulse rate of 148. There was no evidence of pulmonary tuberculosis or hyperthyroidism. An electrocardiogram revealed a simple tachycardia. A blood count showed R.B.C. 4,460,000; Hb 65%; W.B.C. 18,400—polymorphs 56%; lymphocytes 41%; monocytes 3%. Bacteriological examination of her stools revealed no pathogenic organisms, cysts, or ova. A diagnosis of anorexia nervosa was made, and she was treated with a simple diet, with moderate improvement."

She was again referred to Willesden General Hospital by her doctor in Sept., 1941, the symptoms having continued and the patient having lost 2 st. in weight. She was very emaciated and ill, and her general appearance, associated with wasting, anorexia, and amenorrhoea, suggested the possibility of anorexia nervosa. (This diagnosis was made before receiving the report from St. George's Hospital.) On examination, however, an indefinite slightly tender swelling was found in the right iliac fossa. There was no diarrhoea at the time, but the bowels were open twice daily and the stools were well formed. The blood pressure was 90/60. The fasting blood sugar was 78 mg. per 100 c.cm., and successive estimations after 50 g. of glucose showed slightly diminished tolerance. A hypochromic anaemia was present: erythrocytes 5,500,000; haemoglobin 58%; colour index 0.5; diameter of red cells 6.5 μ; leucocytes 10,000—polymorphonuclear cells 67%, lymphocytes 23%, eosinophils 2%, and monocytes 8%. The sedimentation rate was considerably raised—70 mm. in 2 hours. Blood urea was 39 mg. per 100 c.cm. Irregular pyrexia was present, the temperature ranging from 98° to 101° F., and the pulse rate averaging 100. The Mantoux test was positive in 1 in 1,000 dilution. The raised sedimentation rate, pyrexia, and abdominal features were not compatible with the preliminary impression of anorexia nervosa. Roentgenological studies after a barium meal and follow-through examination indicated the correct diagnosis of Crohn's disease, which was confirmed at subsequent operation.

Radiological Report.—"No evidence of any gastric or duodenal organic lesion; the small-gut passage shows a combination of haste and stasis; organic changes are present in the terminal ileum; the caecum is markedly contracted and very tender, and diffuse severe changes of colitis are also present. The differential diagnosis lies between a diffuse ulcerative colitis and Crohn's disease. I think non-specific Crohn's disease is more probable than a tuberculous lesion. The iliac changes are certainly partially obstructive. There is no evidence of any pulmonary lesion."

This patient was seen by one of us (F. W. M. P.) in early October, when she was in a desperately ill condition. Both the physical signs and the *x*-ray findings agreed with a diagnosis of regional ileocolitis. Although the operative risk was obviously great, it was apparent that if nothing was done she would not live long, and it was therefore decided to perform a laparotomy and a lateral anastomosis.

Operation was carried out on Oct. 14 under gas, oxygen, and ether. An acute form of ileocolitis was discovered, involving the terminal ileum, the ascending colon, and the right quarter of the transverse colon. There were many adhesions between the affected bowel and various portions of ileum. In separating one of these between a piece of ileum and the ascending colon a minute perforation of the latter was observed, and as it was not possible to close this owing to the indurated condition of the bowel, an immediate resection of the affected bowel was done and the ileum was then joined to the transverse colon by end-to-side anastomosis. Towards the close of the operation the condition of the patient became extremely bad, and it seemed doubtful whether it could be possible to return her to the ward alive; but she improved slightly after an intravenous serum drip had been started. The patient, however, never really recovered from the shock of the operation, despite a blood transfusion and continuous rectal infusions of glucose-saline, and she died 3 days later. A post-mortem examination was not made.

Pathological Report

"*Macroscopic:* U-shaped portion of ileum and colon, proximal arm 15 cm., distal arm 11 cm., fibrous adhesions between the two loops extending for about 3 cm. along upper part. Wall of gut thickened up to 1 cm. Very little faecal material in lumen, but a good deal of blood clot. In ileum proximally about 2.5 cm. of normal mucosa, followed by irregular areas of ulceration with overgrowth of mucosa between. Caecum more extensively ulcerated and much con-

tracted. Appendix lying alongside and adherent to ileum—its wall also greatly thickened. Ascending colon ulceration more patchy and mucosa becoming normal in transverse colon. *Microscopical:* Regional ileocolitis. Much ulceration of mucosa with purulent exudate. All casts infiltrated with neutrophil and eosinophil polymorphs, plasma cells, lymphocytes, and histiocytes. A few multinucleated cells present. Much fibrosis of submucosa."

Symptomatology

Whereas Crohn found a slight predominance of males, both our patients were females; their ages were 22 and 18, and in the second case the onset was apparently at the age of 11. The disease occurs most commonly in the third and fourth decades, but has been described in a child aged 7, and is occasionally found in the late-middle-age group. The onset was insidious, and both patients had been ill for some months or years before coming to hospital. Crohn stated that "most of the patients had been ill for several months to two years before coming under observation. During this time the outstanding complaints were diarrhoea, continuous loss of weight, and a progressive anaemia."

In Case II diarrhoea was not a conspicuous feature. In the original description it is stated: "Diarrhoea is usually an outstanding feature, though the number of movements and the intervals of the actions never approach those of a true colitis. The stools are rarely mushy or liquid, and may contain pus, mucus, and streaks of blood."

Recovery from operation in Case I was complicated by an ischio-rectal abscess. Crohn (1939) drew attention to this complication, and wrote: "Perianal, rectal, and recto-vaginal fistulas are the most common type of fistulization present in ileitis." In some cases such fistulas had preceded the more characteristic symptoms by some years, and the advisability of *x*-ray examination of the ileum in all cases of ischio-rectal abscess was discussed.

With reference to physical examination, Crohn stated that "a moderate-sized mass is usually felt in the lower right iliac region or in the lower mid-abdomen." This was not so in Case I, and was found only in the late stages in Case II: the absence of such a mass does not contraindicate the diagnosis.

Diagnosis

Crohn and his colleagues (1932) named the following disorders in differential diagnosis: non-specific ulcerative colitis, ileo-caecal tuberculosis, appendicitis, actinomycosis, lymphosarcoma, abdominal Hodgkin's disease, carcinoma of terminal ileum. In 1939 Crohn added non-tropical sprue, gastrogenic diarrhoea of achylia gastrica, thyrogenic diarrhoea, undulant fever, and nervous diarrhoea with a psychoneurotic background.

It is interesting that the initial clinical approach to our 2 patients suggested, not necessarily justifiably, the conditions of Addison's disease and anorexia nervosa respectively. In both the systolic blood pressure was under 100 mm. and the degree of wasting considerable. Pigmentation of the skin may occur in avitaminosis of gastro-intestinal origin—e.g., secondary pellagra (Simpson, 1935).

In Case II anorexia, wasting, and amenorrhoea were suggestive of anorexia nervosa (which was also diagnosed independently in 1934); but the rapid pulse, pyrexia, abdominal features, and absence of constipation, as well as the raised sedimentation rate, were sufficient to prevent the diagnosis being sustained. The *x*-ray examination was conclusive in this patient, and Crohn emphasized its great value. It would seem that a barium meal and follow-through examination are likely to give more positive evidence than a barium enema (see Case I). Crohn stated that the clinical differentiation from non-specific ulcerative colitis is impossible, and the differential diagnosis from this disorder is purely roentgenographic. Ileo-caecal tuberculosis in the adult, in the absence of signs of tuberculous foci elsewhere in the body, Crohn regarded as a much greater rarity than terminal ileitis. The differential diagnosis of this, as of the other conditions he mentions, is ultimately determined by laparotomy and biopsy. Of surgical interest is the persistent sinus after appendicectomy as an indication of an underlying regional ileitis, actinomycosis being another obvious possibility. Here, too, roentgenological investigation and laparotomy may be indicated. In Case II the disease did not stop short at the ileo-caecal valve, but extended into the caecum and colon, which possibility was contrary to Crohn's original views, but was recognized by him in his 1939 paper. Crohn *et al.* (1932) described the radiological findings as follows: "The barium enema is negative. The barium meal may show (1) distended loops of terminal ileum; (2) delay in motility of the meal through the distal end of the small intestine, with 'puddling' in the ileal loops and 'fuzziness' of outline of the terminal ileum; (3) fistula formation."

Pathology

The following report is extracted from Crohn's (1932) paper:

"Macroscopic.—The terminal ileum is thickened, soggy, and oedematous; the serosa is a blotchy red. The mesentery of the terminal ileum is greatly thickened and contains numerous hyperplastic glands. The earliest lesions consist of oval mucosal ulceration, about 1 c.cm. in diameter, located on the mesenteric border of the small bowel and lying in the long axis of the intestine. The characteristic fully developed hypertrophic process is, as a rule, limited to the distal 25 to 35 mm. (10 to 14 inches) of the terminal ileum. The submucosal and, to a much lesser extent, the muscular layers of the bowel are the seat of marked inflammatory hyperplastic and exudative changes. As a result of these, the wall of the bowel becomes enormously thickened, frequently reaching two or three times its normal density. The lumen of the bowel is greatly encroached upon. In the older phases the exudative reaction is replaced by a fibrostenotic process. A marked feature is the tendency towards perforation into the adjacent colon and caecum, and walled-off abscesses occur as complications. [Added in 1939: "The inflammatory processes in the ileum are not always continuous, the pathological unity often being broken by steep areas. Even the jejunum may be involved."] The stained histological sections showed various degrees of acute, subacute, and chronic inflammation, with variations in the predominance of polymorphonuclear round cells, plasma cells, and fibroplastic elements. In some of the cases the presence of giant cells was quite characteristic, but all guinea-pig inoculation experiments with inoculations of triturated material from mesenteric glands and intestinal wall were negative."

Treatment

The surgical treatment of ileocolitis may be carried out in one-, two-, or multiple-stage operations, and must also vary greatly with the state and progress of the disease and of the patient. The operations performed were: (1) lateral anastomosis with or without exclusion of the lesion; (2) resection with or without exteriorization of the lesion; (3) drainage operations—colostomy and enterostomy, with or without exteriorization of the lesion; and (4) excision of fistulous tracts.

The simplest and least severe form of operation is a lateral anastomosis between healthy ileum and transverse colon. This operation alone may be adequate, and Donald and Brown (1941) reported that it is responsible for cure in 25 to 50% of cases. In a previous case (unreported) one of us (F. W. M. P.) performed a simple side-to-side anastomosis where the last 8 inches of the ileum was found to consist of a contracted tube of scar tissue, and this resulted in complete recovery. It is therefore probably safe to say that when the terminal ileum is sclerosed and obviously quiescent and not complicated by adhesions and fistula formation, a lateral anastomosis may be done with or without transection of the bowel between the stoma and the lesion: it should be noted that Crohn, in the discussion following a paper by Mayo and Judd (1941), strongly advises the former. As a preliminary operation to a resection, an anastomosis is very valuable in that, first, it avoids subjecting a severely ill patient to the risks and shock of a severe operation; and, secondly, it allows the general condition to become improved in the interval between the two operations.

Case I gave an excellent illustration of the immediate benefit derived from a simple short-circuiting operation, almost certainly because of the relief of a mild chronic obstruction alone. It will be seen from the continued high sedimentation rate, the occurrence of an ischio-rectal abscess, and the unchanged character of the affected bowel as found at the second operation, that the anastomosis had had no apparent effect on the primary disease. It is possible, though not certain, that a transection of the ileum might have caused some healing in this case.

Case II illustrates the danger of a primary resection in a seriously ill patient. A two-stage operation had been intended,

but was abandoned because of the complications found during operative procedure.

A resection of the affected ileum, caecum, and part of the colon is obviously the correct method of treatment in all cases except those in which the infection is quiescent, and it now seems to be generally recognized that a two-stage operation is to be preferred. Mayo and Judd (1941) gave the mortality rate as 22% for cases subjected to a one-stage operation, and only 3% when a preliminary short circuit had been done. The delay between stages is open to variation in individual cases, but there is no object in unduly delaying the resection, and we feel that one month might be considered to be the optimum interval. Additional safety may be obtained in a single-stage operation by the exteriorization of the anastomosis or by a temporary enterostomy or colostomy. Mayo and Judd advised leaving out the proximal portion of the transverse colon and using it as a temporary colostomy.

There will be certain advanced types of lesion, complicated by fistula formation and adhesions, which cannot possibly be treated along any set lines. In these cases surgical treatment may be extremely difficult and hazardous, and will probably have to be carried out in multiple stages.

Summary

Two cases of regional ileitis (Crohn's disease) in women aged 12 and 18 are described, especially from the aspects of diagnosis and treatment. The importance of roentgenological examination of the intestinal tract after a barium meal as an aid to diagnosis and the advisability of a two-stage operation are indicated.

We are indebted to Dr. E. Rohan Williams for the radiological reports, and to Dr. G. E. Harre for the pathological reports.

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THE PATHOGENESIS OF PULMONARY TUBERCULOSIS OF THE ADULT TYPE

BY

R. C. WINGFIELD, M.B., F.R.C.P.

Much time and thought have been expended on the pathogenesis and exact method of implantation of the initial lesions of pulmonary tuberculosis of the adult type. I think we should be wiser, so long as our views are in the hypothetical stage, to avoid assumptions and dogmatic statements whenever possible, and to be careful, where assumptions are used, to base as little as possible upon them in the arguments that arise. Another mistake we make is in not taking into account the possibility that there can be more than one answer to the question. Such an attitude limits our endeavours and makes it very difficult to fit the facts at our disposal into our hypotheses without a deal of juggling.

I read in an annotation in the *British Medical Journal* of March 7 (p. 332): "There is evidence that . . . are responsible for the development of bronchogenic tuberculosis (*the common type of pulmonary tuberculosis in adults*)." The italics are mine. Here is an assumption which I think is unwarranted. I have read many arguments and studied the data of much research that lead me to suppose that the common type of pulmonary tuberculosis *may* be bronchogenic in many or even the majority of cases, but I have never found anything approaching a proof that this is a fact, and therefore to build up an argument on the assumption that it is is unreasonable and dangerous. Those who have studied the published work on the subject will be able to pick out other dangerously used assumptions like the instance I have given.

It is impossible to fix a truth in the scientific field of knowledge. A hypothesis that satisfies the facts passes into accepted theory, and the theory holds good and must be accepted as truth just so long as no fresh facts come to light which prove it wrong. It is essential in trying to build a hypothesis to explain the pathogenesis of pulmonary tuberculosis that such a hypothesis must be asked to satisfy facts only, and although assumptions must be used in its structure it should not be based upon them.

Accepted Facts

The following are the facts which I believe are accepted by all students of the subject:

1. The majority of the urban population and a large proportion of the rural population are infected by tuberculosis by the age of 30.

2. Pulmonary tuberculosis of the adult type is not the direct result of a primary infection, although in some cases it may follow very closely on its heels.

3. The lesion resulting from a primary infection, if in the lung (Ghon's focus), is due to an inhalation infection. It may be situated in any part of the lung tissue, but the greater number are found in the right middle and lower and left lower lobes.

4. The early lesion of adult-type pulmonary tuberculosis may appear in any part of the lung, but the overwhelming majority are found in the upper thirds of the upper lobes and more often in the right lung than in the left.

5. When examining unselected samples of the population and unselected samples of contacts, adult-type pulmonary tuberculosis is found ten times more frequently among the contacts. The figures are roughly 0.5% and 5%.

It is tempting to add other "facts," but I have not, as they are facts only to me or to a restricted circle of students, and have not been generally accepted; they must therefore fall into the category of assumptions.

Questions to be Answered

The questions the hypothesis must answer are: (1) Why and how does a person get adult-type pulmonary tuberculosis? The possibilities are (*a*) by exogenous superinfection, (*b*) by endogenous exacerbation, (*c*) by a combination of (*a*) and (*b*). (2) By what route does the tubercle bacillus reach the site of the initial lesion of this type of pulmonary tuberculosis—by the respiratory tract, by the blood stream, or by the lymph stream?

Facts Nos. 1, 2, and 5 force the answer to the first part of the first question. Adult-type pulmonary tuberculosis is found in those persons who have been previously infected and is favoured by close contact with persons suffering from pulmonary tuberculosis with positive sputum—that is to say, by superinfection.

The three subsidiary questions to No. 1 and question No. 2 are more complicated, and are so bound up with one another that it is difficult to take them separately; they must be discussed together.

The simplest answer to the remaining question would be that in close contact with sputum-positive cases tubercle bacilli are inhaled in sputum droplets and dust and pass via the respiratory passage to the lung and there set up their characteristic lesions. But this simple answer does not satisfy the facts. Indeed, if it was so simple as that the new lesions would be multiple in most cases and have the same distribution as Ghon foci, and the incidence of the disease among contacts would probably be nearer 100% than 10%.

Ghon foci are definitely inhalation infections, and their distribution in the lungs must therefore give us information on the mechanism and results of inhalation infections. Ghon foci are found in either lung and distributed fairly impartially in all lobes, but the sites of election are the right middle and lower and the left lower lobes. This seems to contradict Bannen's (1942) assertion that an inhalation infection should pass most easily and frequently into the right upper lobe. The fact that an abnormal oily liquid (lipiodol) artificially introduced into the respiratory passages is usually coughed into the bronchus of the right upper lobe is not a conclusive argument. It is an experimental finding which it is dangerous to assume may be repeated under natural conditions. There is a great difference between a blob of lipiodol artificially introduced into the trachea and the 10 μ diameter droplet naturally inhaled (Jacobs, 1941). Bannen states that radiologically (presumably)

haematogenous pulmonary tuberculosis lesions are always easily recognizable. This is also an assumption which I, after many years' experience of *x*-ray interpretation, cannot corroborate. Jacobs in a well-reasoned argument shows the unlikelihood that inhalation superinfection is a cause of pulmonary tuberculosis of the adult type. Yet it seems that close contact and crowding, favouring frequent and massive inhalation infections, are outstanding in the aetjology of the disease.

Two Possible Causative Factors

I think that two possible factors have not been taken sufficiently into account in the many arguments on this subject.

1. What is the effect of frequent doses of inhaled or ingested tubercle bacilli from without on the immunity balance between a host and the tubercle bacilli he already harbours? If these inhaled or ingested bacilli lodge on a mucous surface—and those in close contact with freely talking and coughing open cases must inhale and ingest large quantities of bacilli daily over long periods of time—they must be taken into the system, and if they do not themselves actually cause a new tuberculous lesion they must be destroyed. In their destruction the protein moiety of the bacillus, to which all infected persons are sensitive, will be liberated and must have an effect on the host of exactly the same quality as that of a dose of tuberculin. If such doses of the protein moiety of the tubercle bacillus are frequent and large, some disturbance of the immunity balance in one direction or another is inevitable. An adverse disturbance, if of any great degree or of an appreciable duration of time, should influence the behaviour of the tubercle bacilli lying dormant and clinically inactive in the lymphatic system or elsewhere of all infected persons. I say "elsewhere" with reason, for all are familiar with the small tuberculous focus in the lung which remains unchanged in size for years and yet is seen to be the possible starting-point of a spreading granuloma at some later date.

2. The last barrier between the lymphatic system (which in all Mantoux-positive individuals harbours tubercle bacilli) and the blood stream is the bronchial gland system. Once past these glands the lymph flows unimpeded into the blood stream via the lymphatic duct. Krause's experiments in guinea-pigs show that tubercle bacilli, whatever the site of entry into the body, unless arrested on their travels will always percolate the lymphatic system centripetally, finishing with involvement of the bronchial glands; and, further, that it is not until the bronchial glands have been involved that dissemination to other organs occurs. If the site of entry is the muscles of the leg it will obviously take the bacilli longer to reach the bronchial glands than when the site of entry is the bronchial mucosa, and if the site of entry is the intestinal mucosa they will take an intermediate time. The size of dose and the virulence of the bacilli will also influence their rate of travel. Furthermore, the further they have to travel the greater the number of glands or filters they have to pass and the greater the chances of their being temporarily or permanently arrested on their journey.

In those persons whose bronchial glands contain tubercle bacilli it is not hard to suppose that an adverse disturbance of the immunity balance caused by repeated ingestions of non-lesion-producing tubercle bacilli from an outside source might result in increased activity of the resident bacilli and a seepage of them into the lymphatic duct and thence to the blood stream.

It is not necessary to suppose that tubercle bacilli in the blood stream will always produce widespread generalized miliary tuberculosis: we are all familiar with localized miliary-type infection. Generalized miliary tuberculosis, a comparatively rare event, surely presupposes a gross bacillaemia. The body, especially of the Mantoux-positive, is relatively tolerant of the tubercle bacillus, and in the event of a small entry into the blood stream it is quite possible that such bacilli, when deposited in small numbers in the lung tissues (the lung being the first capillary system they will encounter), may cause no lesion and be destroyed, or if not destroyed may only produce a minimal "secondary" and a non-progressive granuloma, in which they may ensconce themselves for hibernation. Others, again, may be deposited in larger numbers or be more vigorous and be the starting-point of the usual spreading granuloma.

Our knowledge of the rate of flow of the blood in the different parts of the lungs is scanty, but in view of the fact that in normal breathing only the lower halves of the lower lobes are used it is quite possible that without the mechanical acceleration of lung inflation and deflation the blood flow is relatively more sluggish in the upper lobes. This would favour the deposit there of blood-borne bacilli and would fit in with the preponderance of initial lesions, and of new lesions in those already diseased, in these areas. To quote again from Bannen, the fact that most people sleep on their right side, which further restricts the movement of the right hemithorax, might possibly be used as another argument for this being the commonest site for new haematogenous lesions.

A Hypothetical Answer

A hypothetical answer to the questions would then read as follows: Pulmonary tuberculosis of the adult type is found in those persons who have been previously infected and is favoured by close contact with persons who are excreting tubercle bacilli. It is in these cases an exogenous superinfection. It is improbable that the initial lung lesions are caused directly by the inhaled tubercle bacilli. It is possible that these lesions, and new lesions in quiescent cases, may be caused by (*a*) bacilli which come to the lung in the blood stream from foci of living bacilli already in the lymphatic system, or (*b*) bacilli dormant in minimal and unrecognized lung lesions, whose activity in both cases has been increased by frequent massive ingestion into the system of tubercle bacilli from without whose destruction in the body liberates unknown quantities of the protein moiety of the bacillus to which the infected person is sensitive. That is to say, exogenous superinfection causes endogenous exacerbation.

This may appear a complicated hypothesis; but if a simple explanation fails, complexity is unavoidable. I put it forward as a possible hypothesis, not claiming that it is a satisfactory one, that it is true, or even that it excludes others; but as a basis for further study of this fundamentally important subject.

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OEDEMA OF THE GLOTTIS COMPLICATING MEASLES

A REVIEW OF EIGHT PERSONAL CASES

BY

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The recent account in the *Journal* (March 7, p. 325) of 4 cases of coincidental association of measles and laryngeal diphtheria prompts me to place on record the following brief summary of 8 cases of oedema of the glottis complicating measles. It is doubtful whether the possibility of this complication occurring save as a rare eventuality is generally recognized, as most textbooks of medicine and surgery do not include measles in the list of causative factors of oedema of the glottis, nor, in the general sections where reference to the complication may be made, is there anything to indicate that it is more common than such rare abnormalities as abscess of the brain, optic atrophy, or peroneal muscular dystrophy. Measles is as remarkable in the constancy of certain of its features as in the variation, in successive epidemics, of the dominant complication. Thus, bronchopneumonia, mastoid infection, and enterocolitis are common events which may take their turn in this fashion, and less frequently so may oedema of the glottis.

Clinical History of the Cases

In the widespread and severe outbreak of the winter of 1929-30, while in practice, my colleagues and I attended some 950 cases of measles. Of this number about two-thirds were moderately to severely ill, and included 186 cases of bronchopneumonia, 48 of them fatal; but the outstanding circumstance

of the infection was the occurrence of 8 cases of oedema of the glottis with 6 deaths, the 2 recoveries comprising one patient who managed to survive without operation and one who recovered after tracheotomy. Of the 6 fatalities, one took place so rapidly that death occurred within less than 20 minutes of the apparent onset of the respiratory distress, and one was in a child whose parents had agreed to send it into hospital but subsequently changed their mind (the case being "only measles") without making further arrangements; the remainder took place in hospital—three on the night of admission and one the following night. Tracheotomy was not performed in any of the fatal cases—in the first two instances because this was rendered impossible by the march of events, in the other four because temporizing measures were instituted, the condition being diagnosed as laryngeal diphtheria and the respiratory distress thought not to be of immediate urgency.

Attention was sharply focused on the possibility that oedema of the glottis was the factor responsible for the development of the laryngeal obstruction in the second case of the series. This happened to be the younger brother of the first, and he chanced to succumb in identical manner. The elder brother had had a moderate attack of measles with no untoward features until 2 days after the appearance of the rash, when the cough became croupy and some slow dyspnoea and difficulty in swallowing became noticeable. On examination there was no evidence of diphtheria in the throat, no tonsillitis, and no cervical adenitis, but the pharyngeal tissues seemed rather swollen. The boy was transferred to hospital in the late afternoon and died suddenly from acute laryngeal obstruction about 10 o'clock the same evening. The younger brother showed the rash 18 days later, developed stridor and difficulty in swallowing after an interval of 2 days, was transferred to hospital, and died from asphyxia almost at the same hour as had his brother.

Such a striking similarity between the two cases could hardly have been produced by the coincidental association of two unrelated diseases with totally dissimilar incubation periods, but cogitation on the subject was rudely terminated the next day when I was called to the case of a girl of 4 years, who was dead on arrival. The request unhappily had been conveyed by foot messenger, and, although attended to at once, vital moments had been lost. The whole episode, it was possible later to ascertain, had lasted less than 20 minutes, and the mother had not thought of calling in aid until some 10 of these had passed. There had, however, been certain premonitory symptoms, which had not attracted much attention. The fourth patient was the child of those parents who changed their mind about hospital treatment and later were unable to obtain medical aid in time. The fifth recovered after tracheotomy, the sixth died without it, and the seventh recovered slowly without operation after an anxious period of 12 hours. In the last-named instance the obstruction had come on gradually during the night following the appearance of the rash, and had reached its peak about 2 hours before the child was seen. At that time obvious respiratory embarrassment, duskiness, quiet stridor, and laboured breathing were apparent, and there was a troublesome short thick croupy croak, due seemingly to inability to dispose of spittle accumulated in the back of the throat. As the hour was still early it was decided to remain on the spot for a time; after the passage of a couple of hours it became evident that the condition was no worse and might have been a trifle better. As the patient lived only a short distance from the surgery it was arranged that the parent should keep a close watch on the patient's state and at once notify any change. But 4 hours later respiratory effort had become less strenuous and was followed by progressive improvement, although the duskiness was not relieved for a further 8 or 9 hours. Subsequent recovery was uneventful.

The eighth and last case in the series was the most instructive, as it was possible to secure conclusive proof of the nature of the laryngeal disorder. The patient, a girl aged 2, developed difficulty in breathing 5 days after the rash had made its appearance. She was taken by car to the general hospital, where she was seen by the E.N.T. specialist (now deceased), who diagnosed laryngeal diphtheria in spite of all persuasion to the contrary. The child was thereupon transferred to the infectious diseases hospital, where it died later without having had a tracheotomy performed. Death was certified as being due to laryngeal diphtheria and measles. With the parents' permission, however, the coffin was unsealed and the larynx removed, when examination disclosed almost total obliteration of the airway due to oedema and not a shred of membrane!

Other Series of Cases

As is to be expected, similar incidents were experienced simultaneously in other parts of the country. Thus in one small institution in a provincial town there were 6 deaths from this cause within a few weeks, and it has been possible to ascertain that each case had developed characteristic premonitory symptoms, the significance of which was not appreciated, and all these patients died rapidly within a matter of minutes from sudden laryngeal obstruction. The premonitory period had varied between 3 and 6 hours, a finding in complete agreement with that of the present series. The operative mechanism, however, had not been manifest to those in charge, so that towards the end considerable alarm had been occasioned as the children successively choked to death. In London, three medical acquaintances had between them 4 such cases, with one other, which may have been doubtful, as there had been diphtheria in the house about a fortnight previously. And so, no doubt, could instances be gathered from all parts of the country if this were desired. In all the above cases, a total of 18, it may be added that pharyngeal swabs were taken in 12 and examination for K.L.B. proved consistently negative.

Diagnosis

It is of some importance, apart from the desirability of accurate diagnosis, to differentiate between oedema of the glottis complicating measles and laryngeal diphtheria occurring in association with the disease, because failure to do so may result in loss of life. The main reason for this calamity probably arises from the fact that the premonitory features of obstruction in oedematous laryngitis are much less suggestive of impending closure than in laryngeal diphtheria, the process being insidiously progressive almost to the final point when suffocation rapidly and violently ensues. In diphtheria there is seldom need for extreme urgency. The condition may often be diagnosed by ear on the doorstep, by the nose on the stairs, and by a glance in the patient's room. The noisy stridor, the marked croupy cough, the vigorous paroxysms of suffocative dyspnoea, are features which early constrain attention and should ensure timely measures. The reason for this fundamental distinction is not obscure, and lies in the different character of the responsible morbid processes. In diphtheria the interior of the larynx becomes filled with membrane, which often spreads over the cords and downwards into the trachea. Irritative and obstructive phenomena are therefore early features and provide fair warning of what is to be expected. The formation of membrane is a gradual process, and so, too, is the obstruction, apart from the croupy paroxysms or suffocative spasm due to detachment of a portion of membrane. Except, therefore, in neglected cases or in infants, extreme urgency in membranous croup is a rare event and tracheotomy is seldom done *au grand galop*.

In oedema of the glottis, however, the position is quite different. In the first place, the vocal cords are little affected owing to the close attachment of the mucous membrane to the underlying cartilage. Stridor therefore is not marked as an early feature and probably does not occur until the oedematous process is well under way. Secondly, the swelling is most pronounced in the lax tissues of the upper aperture of the larynx, giving rise fairly constantly to two early clinical items—namely, difficulty in swallowing, produced by the oedematous infiltration of the epiglottis and attendant aryepiglottic folds which mechanically hinders the initiation of the swallowing act, and slow laboured dyspnoea due to narrowing of the air channel. Thirdly, the infiltrative process, although regular in its progression to a crisis generally within a period of 2 to 6 hours, when fatal obstruction may supervene, is not accompanied by concomitant prognostics, so that the gravity of the situation may not be patent. Thus it may be appreciated that oedema of the glottis in measles, with its subtle onset and insidious development, when confused with laryngeal diphtheria

may well tempt the clinician to hazard conservative measures, with most serious consequences unless immediate relief is at hand.

Summary of Conclusions

It may be of service, therefore, to summarize the features of oedema of the glottis complicating measles and to emphasize a few points which may help to distinguish it from laryngeal diphtheria:

Its occurrence may be a feature of certain epidemics, when the incidence is probably under 1%.

The process tends to make its appearance after the rash, most commonly about 2 days later, although there are instances of its developing as early as the first day and as late as the fifth day.

It is not necessarily associated with a prodromal laryngeal catarrh, although laryngitis was a feature of the epidemic relating to the present series.

Premonitory symptoms are constantly present for a period of 2 to 6 hours. They consist mainly of croupy cough, subdued stridor, slow dyspnoea, and difficulty in swallowing. They are progressive, but, in contradistinction to laryngeal diphtheria, are not concomitantly indicative of the degree of laryngeal occlusion, so that the grave nature of the affection may be overlooked. Once the obstruction becomes marked, fatal asphyxia rapidly ensues, often within 20 minutes. One case, however, recovered spontaneously, and one succumbed after an apparent improvement lasting 24 hours.

In a doubtful case diagnosis may be made by opening the child's mouth and sticking a finger down the throat, when the swollen epiglottis and aryepiglottic folds can be quite easily felt.

Indications of diphtheria will generally be absent; but the possible association of faucial disease should not dispose the clinician to temporize if the laryngeal symptoms have made their appearance within the few days following the eruption and present the above-mentioned characteristic features.

The mortality in untreated cases is probably not far short of 100%. Thus, in 8 cases of the present series there was only one spontaneous recovery, and in 10 other undoubted cases there were none.

Oedema of the glottis complicating measles is not an academic curiosity but a vital entity which may confront the practitioner at any time during an outbreak of the disease.

Medical Memoranda

Full-term Extra-uterine Pregnancy with Living Child

For the sake of record and to emphasize a method of treatment, I have been urged to write this case report and to refer briefly to three others.

Case Record

The patient, a 7-para aged 39, was admitted to Mackay Memorial Hospital, Taihoku, Formosa, on March 1, 1931, in an exhausted condition, with a history of "having been in labour" three days. The radial pulse could not be felt. The pulse was 55, respiration 38, temperature 35.2° C. (95.4° F.). There was a history of severe abdominal pain for three days, with blood discharge from the vagina; she was constipated during this period. The movements of the child could still be felt by the mother. The last menstrual period had occurred from April 13 to 15, 1930. In June and in September she had had attacks of abdominal pain which kept her in bed a few days, and according to the husband there was no vaginal bleeding at these times. From January 5 to 15, 1931, and from February 27 to March 1 she had had further attacks of pain which doubled her up, the pain at the final attack being the most severe of all. On vaginal examination the cervix could not be felt; by abdominal examination the foetal parts were unusually easily palpated and seemed to be just under the skin. A diagnosis of full-term extra-uterine pregnancy was made and immediate laparotomy undertaken.

The secondary gestation sac was filled with a greenish-yellow fluid and had adherent omentum and gut over a wide area. The cord was ligated and divided, and the child delivered. The placenta was firmly adherent to the left side of the posterior wall of the abdomen, extending down to the uterus, which could be felt drawn up and to the left, small and firm; the placenta was also adherent to the small gut, which was distended, red, and velvety. There was no haemorrhage in the sac or in the peritoneal cavity. The patient died fifteen hours later from ileus and shock. As there was no time to investigate the exact relations of placenta and uterus at the operation, the husband gave permission for a limited post-mortem examination on condition of his being present. This was carried out in the operating theatre, and the following is a copy of my notes made at the time: "Post-mortem examination 10.20 a.m. in operating theatre, husband and his sister present. Operation wound opened up; there was no blood in the sac or in the peritoneal cavity. Placenta adherent and involved the left side of abdomen and left side of uterine fundus; could not palpate adnexa of right side. Without further cutting could not free placenta or see pelvic contents. Husband, a very sane man, considering we had found out what was necessary, did not want her cut any further."

The child was a well-formed healthy girl weighing over 7 lb. (the chart did not record the weight, but I have distinct memory of her being well over normal weight). Her subsequent history showed that she was not only a beautiful normal child but above the average in intelligence. As the husband considered she had been the cause of the mother's death he did not want the infant, and she was offered to me for adoption. One of my native nurses adopted her by paying the sum of one yen. The child was still alive and well in November, 1940, when I left the district.

From the end of the patient's last menstrual period till the day of delivery was 320 days. It would be interesting to know just how long, under these circumstances, a child could live. It is evident that this one was near the end of active life, as when removed from the mother it did not at once show signs of life; but while I was still attending the mother the infant started to cry.

Other Cases

In 1914, in Tainan, Formosa, I had a case of full-term extra-uterine pregnancy in a woman aged 42. This case was reported in the *China Medical Journal*, 1915, **29**, 14, from which I quote: "Child removed from its bed with as much of the surrounding sac as could safely be taken away, then the margins of the sac were stitched to the abdominal opening and the cavity packed with two towels. The bowel was adherent all around the sac. Patient ran a septic temperature from 97° to 103° F. for thirty-seven days, after which the temperature remained normal and she made an uninterrupted recovery. Seen five months after operation the wound had quite healed, and her only discomfort was pain on menstruating. . . . The child (dead) weighed 7 lb. and was well formed."

In 1934, in Taihoku, in one ward at the same time were two cases of extra-uterine gestation ruptured in the earlier months, and two full-term extra-uterine cases, ages 38 and 40, each with dead child. All four patients recovered. The treatment in each full-term case was the same: the placenta was undisturbed, cavity lightly packed, and neither gave any further anxiety—this in contrast to the method of immediate removal of the placenta, when "the immediate after-treatment of such cases is always an anxious matter" (Whitehouse, 1935). One of these patients was running a septic temperature on admission, and her wound healed two or three weeks before the other non-febrile case. In none of these last three cases was there any haemorrhage in the sac or peritoneal cavity.

The point in treatment I wish to make is that by marsupialization and allowing the placenta to disintegrate and come away gradually, without over-zealous use of forceps and scissors, even with the risk of sepsis and secondary haemorrhage, the total risks involved are fewer than when an attempt is made to remove the placenta at once, which may be met by "formidable technical difficulty" and "haemorrhage of the most severe kind . . . very difficult to control" (Whitehouse, 1935).

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Nasal Insufflation of Sulphathiazole Powder for Diphtheria Carriers

When discussing diphtheria carriers Dudley (1928) stated that "in many environments swabbing and isolating carriers as a preventive measure is often a mere waste of time, which would be better employed in doing something useful." Nevertheless some of us still try to produce the required negative swabs.

Delafield, Straker, and Topley (1941) described their results with antiseptic snuff as "suggestive," and though this fair statement did not refer to diphtheria bacilli in particular, the inclusion of the "diphtheroids" has no doubt stimulated many to tackle once again the problem of the carrier of Klebs-Loeffler bacilli. Continuing their work, Delafield and Straker (1941) stated that snuff containing sulphathiazole "is effective in the cure of carriers of Hoffmann's bacillus and is likely to prove effective in the treatment of chronic nasal diphtheria carriers." Thomas (1941) recorded the treating of a small number of diphtheria carriers with sulphathiazole powder in the form of snuff. The difference between his controls and the treated cases was "not statistically significant," and his results were "promising but not uniformly successful." As possible causes of lack of success he mentioned failure to administer the snuff adequately to the very young, heavy crusting in the nose preventing contact between the powder and the area to be treated, and the likely presence of *C. diphtheriae* in the sinuses.

We understand that the powder is "sniffed" so that the particles may follow the normal course of the air currents in the nasal passages and eventually lodge on the same tracts of mucous membrane as those occupied by previously inhaled bacteria. This is no doubt accomplished by the co-operative patient, and while we agree with Delafield and Straker that many children become "eager and enthusiastic snuff-takers" the same cannot be said of infants. We therefore decided to try the effect of insufflation of sulphathiazole powder.

METHOD

A single No. 15 De Vilbiss powder insufflator can be used for a group of patients. Each patient has his own "nasal piece." This consists of about an inch of glass tubing, rounded at one end to prevent scratching of the nares; an inch of rubber tubing is attached to the other end. During "a treatment" this "nasal piece" is fixed to the barrel of the insufflator by means of the rubber tube. This glass-and-rubber attachment is boiled after use, thus reducing the risk of reinfection and cross-infection when a number of insufflations have to be carried out.

Only senior nursing staff are permitted to carry out the treatment, which consists of: (1) simple nasal toilet; (2) insufflation of powder into each nostril (nasal insufflation is performed even when the throat alone is the source of positive swabs)—one squeeze of the bulb for infants under one year, two squeezes for those under 3 years, three squeezes for those over 3 years; (3) four treatments between 8 a.m. and 6 p.m.; (4) swabbing never less than 12 hours after an insufflation; (5) swabbing on alternate days until 3 consecutive negatives are obtained, and then 7 days after treatment has been stopped. Periodic white cell counts were done at the beginning, but were discontinued as a routine because prolonged treatment was unnecessary

The swab material was planted on a Loeffler's slope and then on a Neil tellurite plate. Films from the Loeffler slope were examined with Albert's stain after 12 hours. Any suspicious colonies from the tellurite plates up to 48 hours were transferred to Loeffler slopes and examined next day for morphology. Suspicious organisms were tested for virulence.

BRIEF DETAILS OF 12 CASES TREATED

The ages of the patients ranged from 8 months to 6 years. The bacilli isolated were all virulent, 10 being of "gravis" type and 2 of "mitis" type, and the duration of the carrier state varied from 10 days to 4 months. Eleven of the 12 cases became negative, and the average interval from the beginning of the insufflation treatment until repeated negative swabs were obtained was 5 days. Five cases were reswabbed four months after the cessation of treatment, and all were negative. These results encouraged us to continue the experiment in a larger controlled series.

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Reviews

SOCIAL BIOLOGY

The Body as a Guide to Politics. By Walter B. Cannon. The Thinker's Forum, No. 15. (Pp. 47. 6d.) London: Watts and Co. 1942.
The Discipline of Peace. By K. E. Barlow. (Pp. 214. 8s. 6d.) London: Faber and Faber. 1942.
Europe in Eclipse. By A. Kerr Clarkson, M.B., Ch.B. (Pp. 346. 15s.) London: Robert Hale, Ltd. 1941.

The present challenge to civilization has naturally caused searchings of heart among medical men, leading many of them to apply their specialized training to current problems. This application of biology to sociology found a pioneer after the last war in Morley Roberts, and our inability to agree with the later developments of his theories must not deprive him of the credit. The pitfall in such applications is the mistaking of analogies for homologies, which, as we should expect, a physiologist so eminent as Prof. W. B. Cannon avoids in his *The Body as a Guide to Politics.* He points out that the external activities of the organism are directed towards our environment, producing changes which have to be corrected by internal activities that aim at maintaining stability—i.e., homeostasis. Thus our bodies have become to a high degree liberated from deranging external influences. Can this sort of liberty be achieved in human society, which is still in an early stage of evolution? In the body politic an initial disturbance, instead of promptly arousing protective and corrective factors, often starts a harmful process which spreads through a community with accelerating speed. The higher biological organisms, composed of extraordinarily unstable stuff, have gained stability by developing wide margins of safety in their structure and pre-eminently by corrective factors set in action by delicate signals. Prof. Cannon goes on to discuss the conditions necessary for a corresponding social homeostasis, maintaining that more control is tolerable if it results in greater human freedom. A lucid and helpful exposition in small compass.

Dr. K. E. Barlow's *Discipline of Peace* bases its appeal on the broadest biological grounds. He insists on the inexorable interdependence of soil, vegetation, and animal life, pointing out in no uncertain tones the failure of the industrial age to observe it and the grave consequences thereof. In an interesting way we are led from a consideration of the building up of fertile soil by vegetable life to the building up of potential energy through photosynthesis by plants which provides for the kinetic activities of animals, combined with the reverse process by which animal and vegetable waste products are utilized. The facts are well known, though not, as he shows, always acted upon. But the point he emphasizes is that each of these three entities is obliged to follow its own discipline, and that interference by man can and does disastrously upset the balance. Deforestation, often merely to supply newsprint, and agriculture pursued to yield immediate returns regardless of the future, are rapidly reducing large areas of previously fertile land to dustbowls or swamps. Industrialization has led to excessive raids upon Nature to supply the machines, and the products of those machines have in turn to be bartered for yet more products of the soil. Moreover, it has led to aggregation of population into towns, thus simultaneously increasing the demands on Nature while diminishing its yield. Man must cease to be a bandit of the soil and in turn observe his own discipline, which he can do only by the free exercise of his intelligence. If we want to build a world in which men can live at peace, we have no choice but to pass to a new era in which man must concern himself with the balance and harmony of life. The whole thesis is convincingly worked out to show that, while physics may increase our material comforts (or, we might add, pave the way to new disasters), only biology can be the scientific guide to a true way of life.

Dr. Kerr Clarkson envisages *Europe in Eclipse* from the standpoint of a psychologist. In psychology he had the best of preliminary training—general practice. In 1936 he gained the B.M.A. Charles Hastings Prize for his essay on asthma in general practice. His present book is based on a series of lectures delivered to various societies during the last few years. This has involved a certain amount of repetition and lack of

continuity, which is unfortunate, as there is much valuable material in the lectures, which would have had a wider appeal if they had been recast and co-ordinated. There are some curious slips—e.g., William Macdougall was not an American, and the temple of Epidaurus is not on the island of Cos. But these are details. The first hundred pages are devoted to a simple exposition of psychological principles, followed by an application of these to Germany. Always a nation worshipping military prowess, defeat was a blow to her self-esteem which produced an intolerable sense of frustration, ready to break out into aggression and revenge. Hitler came to power because the despair in Germany was an echo of the anxiety in his own mind. His Youth Movement was his method of harnessing the challenging demands of puberty to the service of the State. The democracies, tired of slaughter and looking forward to cultivating a higher civilization, failed to realize the terrific psychic forces released by regression to the primitive emotional unconscious, once there was a leader to assume the role of Wotan. France sheltered her unwillingness to fight behind the Maginot Line, which was also a psychological symbol, the failure of which led to spiritual collapse. We suggest that perhaps, leaving the door open at Sedan, with its associations of defeat, may have been an unconscious expression of despair, but we can hardly agree with the author that "a devastating mass air raid on the first Sunday of the war would have forced a capitulation of Britain within a week." We can agree, however, that the weakness of democracy is the absence of a sufficiently passionate unifying emotion, not merely against an aggressor but towards a positive goal. Of his remedies, admittedly tentative, there is not space to dilate, but we would re-echo his quotation from William James, who had a "vision of a democracy stumbling through every error until its institutions glow with justice and its customs shine with beauty. . . . Our better men shall show the way, and we shall follow them."

It will be observed that all these writers inevitably tend to be critical and inquiring, while their constructive schemes are rather embryonic. But it is satisfactory that a science of social biology is evidently coming into being, to which biologist, physiologist, and psychologist alike can make their contribution.

THE SALE OF MEDICINES

The Law Relating to the Marketing and Sale of Medicines. By H. E. Chapman. (Pp. 169. 7s. 6d. net.) Bedford: Henry Burt and Son. 1942.

The manufacture and sale of drugs other than poisons were until last year almost unrestricted. The demand for patent medicines in this country is enormous, and their variety is still, in spite of the war, very great. Parliament passed from time to time a succession of Acts with the object of taxing them, and these accumulated into a tangled spinney of confused, obsolete, and often contradictory verbiage. As long ago as 1914 a Select Committee pointed out the evil of allowing any person to advertise any drug, other than a scheduled poison, as a cure for any disease, but Parliament made no move until 1941, and then did so only from a financial motive. The Government desired to repeal the medicine stamp duties, and could only do so by tidying up the trade in medicines and compensating the registered pharmacists. The result was the Pharmacy and Medicines Act, 1941. This, although it has not gone as far as the Select Committee of 27 years ago recommended, has greatly improved the situation, but its legal and practical implications are by no means easy to understand.

Mr. Chapman's book will therefore be most valuable to pharmacists, medical practitioners, lawyers, and all others who desire to obtain a clear idea of the present law on the sale of medicines. As a barrister and a member of the Pharmaceutical Society he approaches the subject from two aspects, and has made himself a master of it. He does not follow the practice of taking the statutes and commenting on them section by section; this is not so much a legal textbook as a broad survey of the situation as it is, with a clear exposition of the law affecting it. He sketches the history of the trade, and of the various enactments which have attempted to regulate it, in an introductory chapter; and then explains the manufacture, distribution, and scope of prepared and proprietary medicines, with the chief facts about the organization of the industry. He points out the operation of the 1941 Act upon various classes of medicines, and devotes separate chapters to its requirements of disclosure of the composition of medicines, and its restrictions on their advertisement. He concludes with a chapter on the effect of the Food and Drugs Act, the Therapeutic Substances Act, and the recent price-control and fiscal legislation. He adequately summarizes the provisions of the Dangerous Drugs Acts and the Pharmacy and Poisons Act.

This is an admirably clear and compact little book, and, considering its size and the enormous width of its subject, leaves out very little.

TREATMENT OF FRACTURES

A Manual of the Treatment of Fractures. By John A. Caldwell, M.D. (Pp. 150; illustrated. 19s.) Springfield and Baltimore: Charles C. Thomas; London: Baillière, Tindall and Cox.

A manual of fracture treatment for house-surgeons and general practitioners is necessarily brief, but is any useful purpose served by the publication of a book which carries brevity to the length of dismissing fractures of the carpal scaphoid bone in three sentences, and the treatment of fractures of the thoracic and lumbar regions of the spine in one confused paragraph? Is there justification for summarizing fractures of the astragalus in the astonishing observation that "treatment is similar to fractures of the os calcis"? Brevity would be better served by making no reference at all than by comparing two fractures which have no single feature of treatment in common.

The author declares that it is his intention "to elucidate principles of treatment rather than to describe specific methods," but it is the lack of elucidation of principles which is the characteristic feature of the book. There is no indication of the part played by early active exercise. Fractures of the clavicle are illustrated with the hand strapped flat on the chest wall, so that finger movement is impossible. Fractures of the wrist are demonstrated in a plaster which extends to the webs of the fingers, thus almost completely limiting movement of the metacarpo-phalangeal joints. It is accepted as inevitable that "when a splint is first removed, all movements of the part are limited in excursion, painful, and lacking in vigour." The treatment recommended includes frequent changing of the plaster, judicious massage, and passive motion. Later, one learns that "a half-hour application of heat before massage or passive motion makes the seance more comfortable." "Seance" is the right word.

The treatment of delayed union and non-union is no less misleading. Nowhere is the need for continuous and uninterrupted immobilization made clear. If a fracture of the tibia is not united within six weeks, "union has failed." Six weeks! The patient must then "stand on the good leg and stamp the heel of the injured leg as many times as he can." Bone-grafting is considered in five lines, and it is then concluded that "sometimes all measures fail . . . the patient must reconcile himself, wear a brace, or submit to amputation."

There is not even a passing reference to avascular necrosis of the femoral head, although two pages are devoted to traumatic dislocation of the hip-joint, and eight pages to fracture of the neck of the femur. Fractures of the patella and fractures of the olecranon are discussed, with no hint that operative treatment may sometimes include excision of one fragment. Volkmann's contracture is considered with no mention of arterial injury.

Notes on Books

The late Dr. W. McKIM MARRIOTT's well-known book on *Infant Nutrition* has been revised for a third edition by Prof. P. C. Jeans (Henry Kimpton, 27s. 6d.). Thus the excellent scientific framework made by Marriott is modernized with recent additions to the subject in an able manner by Jeans. This remains one of the best expositions of this subject, sound and well balanced. It should be noted that in such a book, in which empiricisms have been replaced by scientific fundamentals, there is no mention of percentage feeding or so-called "humanized" milk mixtures.

Preparations and Appliances

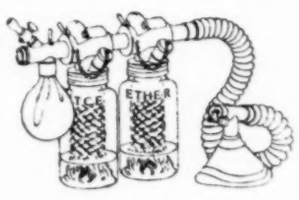
APPARATUS FOR OBTAINING GENERAL ANALGESIA AND ANAESTHESIA

Dr. H. REX MARRETT, senior resident anaesthetist,, Hill End Hospital (St. Bartholomew's), St. Albans, writes:

Anaesthetic apparatus of to-day that is suitable for administering anaesthetics for all types of operation is not only a complex costly mechanism, but also a cumbersome affair. It is with these points in mind that I present this simple machine.

Description of the Apparatus

The vaporizers have been designed to give the maximum concentration with the minimum of resistance to inspiration. At the top is a slide mechanism similar to that on a Boyle's vaporizer. Connected to this is a wide-bore tube, divided longitudinally by a septum, passing down inside a standard large ether bottle. This tube is surrounded by a thick wick. One of these bottles contains trichlorethylene and the other ether; if both bottles are used it is safer to have the ether bottle nearer the patient, because the non-inflammable trichlorethylene will not get contaminated with ether vapour. There is a bag mount with a 180-c.cm. bag, which can be turned on or off by means of a slide. A simple rubber flap inspiratory valve is situated at the open end of the structure, with a tap between it and the bag mount. There is a standard expiratory valve at the face-piece, which is connected to the machine by 18 inches of non-kinkable tubing. All the joints are standard and interchangeable, so that the machine can be used with one or two bottles. Either bottle can be connected on to a Walton gas-and-oxygen machine.



Methods

Obtaining Analgesia.—The principle of the machine is that the patient draws air through one or both of the bottles, according to the position of the levers. Therefore it is best to hold the mask on the face to obtain the essential gas-tight fit. If this manœuvre is preceded by a few words of explanation most patients will give full co-operation. I allow the patient to take a few breaths of air through the machine and then give the small amount of trichlorethylene needed. After about 10 breaths I give the surgeon a sign to start, warning the patient at the moment that he will feel the surgeon touching him. If the pain is too much for the patient or the surgeon decides to do some more extensive operation it is best to stop and put the patient into the third stage by increasing the concentration of the trichlorethylene very slowly, otherwise he will gag and cough. It is now clearly easy to get a patient into the second stage by mistake while trying to maintain a state of analgesia. This can be prevented by occasionally talking to the patient and not increasing the concentration of the trichlorethylene beyond a mark on the machine. If the patient does become uncooperative a few breaths of air will soon bring him back to consciousness. The machine has proved invaluable on the Chest Unit, and for painful dressings, etc.

Obtaining Anaesthesia.—The mask must again be held on the patient's face to get a gas-tight fit. The next most important point is, as already mentioned, that the concentration of the trichlorethylene vapour must be increased very slowly, taking from 5 to 10 minutes to get into the third stage. At this point it is best to insert an artificial airway. If an endotracheal tube is necessary one can be passed. If a nasal tube is passed, then the throat must be packed or a piece of elastoplast put over the mouth. Orally, a balloon-cuff tube is the best. This last manœuvre may not be possible with trichlorethylene alone, but relaxation can be readily obtained with the addition of ether. The purpose of the side tap—for the suggestion of which, with others, I am indebted to Dr. C. Langton Hewer—is for introducing oxygen in artificial respiration, for extremely ill patients, for use when the machine is employed for insufflation for tonsillectomies with a Davis gag, and for upper abdominal operations. Another point is that, if necessary, ethyl chloride can be used during the induction of a very resistant patient. If I anticipate such a case or intend passing an endotracheal tube, I always induce with an intravenous barbiturate, and insert an airway immediately. The concentration of trichlorethylene and ether can be increased then much faster, and the time taken to relax the glottis for the insertion of an endotracheal tube is about 3 to 4 minutes. The bag is employed to increase the CO_2, which is useful during the induction. The size of the bag is such that when the patient has emptied it enough oxygen is obtained from the air during the same inspiration to prevent the majority from becoming cyanosed. About 200 administrations have been given, including 70 successful analgesias. The ages in the latter range from 8 to 67.

Types of Operation

Under Analgesia.—For the removal of packings from chronic empyema cavities and lung abscesses the apparatus is particularly useful, because the cough reflex is not abolished, nor is the patient's ability to co-operate. This is a safeguard, because in the event of a haemorrhage there will be no possibility of the blood gravitating into the sound lung without the surgeon's knowledge. It is also used for the removal of other packings, such as from frontal sinuses and prostatectomy operations, etc.; for insertion of Steinmann pins; for wedging and removal of plasters; for cystoscopies; and especially for retrograde pyelographies, in which the surgeon is greatly helped by the patient's ability to co-operate during injection of the dye. I have come to the conclusion that an incision of the skin, such as opening an abscess, cannot be done under analgesia obtainable with this machine. Out of the 70 analgesias only one case vomited.

Under Full Anaesthesia.—There does not seem to be any operation that this machine cannot be used for. Possible exceptions are chest surgery, owing to the increased rate of respiration that sometimes occurs with trichlorethylene, making the operative procedure more difficult; and manipulations, because these, I think it is agreed, are best done with an intravenous anaesthetic. When using trichlorethylene alone it is possible to do all minor and a large number of major operations, which would make it useful under Service conditions. The ether need only be used to get complete muscle relaxation; it can then be discontinued.

Advantages of the Machine

1. Portability and Simplicity.—The whole machine, with 10 oz. of liquid in each bottle, weighs approximately 6¼ lb., and its portability makes it convenient for the G.P. and the Services. No gas cylinders are necessary, but if the patient was sufficiently ill to require oxygen there would in all probability be some in the theatre of the nursing home or hospital. Its portability is fully realized when a minor operation has to be done in the ward, and only a few breaths of air are necessary to bring the patient back to consciousness, thus relieving the strain on the nursing staff. The cost of the machine, which is being made by A. Charles King, Ltd., with one vaporizer is about £5, with two vaporizers £8.

2. Being able to obtain a high degree of general analgesia and, if necessary, carry on into the third stage with the same machine.

3. Economy in Use.—I have found that with the lever at the three-quarter position the trichlorethylene is used at the rate of 3/4 oz. an hour—i.e., at an approximate cost of 5d.—and the ether at 6 oz. an hour—i.e., at an approximate cost of 1s. 6d. This compares with a nitrous-oxide–oxygen–ether administration on a semi-closed circuit machine at about 5s. an hour.

4. Non-inflammability.—The trichlorethylene is completely non-inflammable, so that the diathermy or cautery can be used with safety.

5. Remote Control.—Although the length of non-kinkable tubing has been restricted to 18 inches, with the idea of reducing the dead space and resistance to inspiration, the machine can be kept out of the way when operations on the head and neck are in progress.

6. No hot water, chemicals, or even a cold-water bath is necessary for either vaporizer.

7. Patients do not have any unpleasant taste on waking after having had trichlorethylene.

8. Patients very seldom vomit after the use of trichlorethylene alone for full anaesthesia.

Disadvantages

1. The chief disadvantage is the increased time needed for induction into the third stage; but this can be easily overcome by a small dose of an intravenous barbiturate. As mentioned above, I employ this method regularly for very resistant patients and when I anticipate passing an endotracheal tube.

2. The lack of complete muscle relaxation when using trichlorethylene alone. This is overcome, however, by the use of the ether vaporizer.

3. The Occasionally Increased Respiration Rate when using Trichlorethylene alone.—Although the rate of respiration may rise to 50 to 60 a minute, patients do not get apnoeic, and by allowing them to breathe air alone for a few breaths or by changing over to the ether it is possible to restore the rate to normal.

4. Some patients have complained of feeling drowsy post-operatively, but I have noticed that it is those who have shown signs of heavy premedication.

BRITISH MEDICAL JOURNAL

LONDON

SATURDAY MAY 23 1942

THE FURTHERANCE OF MEDICAL RESEARCH

Medical research as we understand it to-day is a recent development. It is true that Harvey, who showed us how to use the experimental method, preceded Claude Bernard by 200 years, but the wide extension of the experimental method to the problems of health and disease is a product of the last two generations. New, too, is the creation of foundations for the promotion of medical research. Their growth is one of the most remarkable features of our times. The capital of thirty-three foundations in the U.S.A., many of which explicitly favour medical research, now totals over 818 million dollars. All have been founded since 1900 and at least fifteen since 1920. In this country the Lister Institute was founded (as the Jenner Institute) in 1891, but the Medical Research Council, the Beit Memorial and Lady Tata Memorial Trusts, and the Nuffield Benefactions have all arisen during the last thirty years. It is no longer possible to consider medical research in isolation, as an interesting and profitable enlargement of native curiosity. It now has a setting in relation to finance, education, and politics. No one has had a better opportunity to study the forces at work than Dr. Alan Gregg, the Director for the Medical Sciences at the Rockefeller Foundation, and his Terry Lectures on *The Furtherance of Medical Research*[1] are of special value at the present time.

Wilfred Trotter said that the experimental method is like a machine: once it has been started it goes on discovering things. But machines, whether steam-engines, cotton looms, or aircraft, have a way of introducing complications as well as benefits into life. One is the gap between discovery and application. A new drug goes round the world in a few months like a fashion, but the application of equally important but less immediately rewarded discoveries such as diphtheria inoculation or optimum hours of work may be indefinitely retarded because it requires educative or legislative action. The propriety of patenting in the medical field is one of the most vexed questions of the moment. The declared object of the Patent Law is to stimulate invention, and it is clear that chemotherapeutic research, which needs the resources of industry for its prosecution, could hardly proceed in the framework of a competitive society without the promise of a reward. The production of a cheap synthetic quinine or a simple preventive or cure for typhus might significantly alter the course of the present world conflict. Nevertheless, patenting has tended to introduce an increasing embroilment, distrust, and obscurantism into the world of science and to act as an inhibition rather than a stimulus to invention. Nor is it here alone that research may suffer from *auri sacra fames*. Industry, the research institutes, and the universities are now in competition for the best talents, but any impoverishment of the universities would in the end be a disadvantage to all three.

The educational requirements of the research worker and the practitioner are very different, and some of the disharmony which exists between research and practice, between preclinical teachers and clinicians, is due to failure to realize the parting of the ways. Dr. Gregg speaks wisely of "unabashed romanticism . . . because it is romantic to believe that genius for research exists everywhere but unrecognized and in such large numbers that instruments and a salary or two are all that is needed." Trotter spoke of the experimental method as if it were a machine, but it is a machine which can function only if the best and aptest brains are in charge of it. There will always be need, and increasing need, for what Huxley called the honest hodmen of science. There will always be, and in too great numbers, "the timid men who find haven in the laboratory, and those who are on the make and use research as a springboard to a better-paying job." There will never be too many good researchers. As Sir Edward Mellanby said in his Harveian Oration in 1938: ". . . the real discoverer is a rarity in all classes of society." It will always be expensive, as Dr. Gregg says, to recruit for later selection a considerable number of young investigators at a time when they cannot fully estimate the strength of their own curiosity or realize the rewards of a life spent in satisfying it. We must cast our bread upon the waters in the hope that we shall find it after many days. But much has now been learnt, not without disappointment and suffering, about the furtherance of medical research and the discovery of research talent, and Dr. Gregg's book is likely to remain for long the bible of those who have these aims at heart. He has indeed most ably carried out the object of the Terry Lectures, which is "the assimilation and interpretation of that which has been . . . discovered and its application to human welfare."

[1] New Haven: Yale University Press; London: Oxford University Press. ($2.00 or 12s.)

RESISTANCE TO TRANSPLANTED TUMOURS

The many pitfalls in experimenting with transplanted tumours are not immediately obvious, and all too often their dangers have remained unsuspected or, if suspected or known, have been underestimated and ignored. Scepticism, as well as lack of knowledge of established facts, must be held responsible for that very remarkable persistence with which transplantable tumours have been used unwisely even up to the present. It has seemed incredible that reactions having no essential connexion with the malignant process can materially mislead: transplanted tumours have been freely used when caution would have forbidden; and many experimental observations have been unwittingly but none the less confidently misinterpreted. The result is that much of the total effort of cancer research has been dissipated in following false clues which ought to have been recognized as such from the start, or in accumulating further evidence in efforts to convince the unwary that in cancer research the utility of transplanted tumours is indeed very strictly limited. To-day those who make use of transplanted tumours are generally more prudent, but a brief survey of the pertinent facts seems to be called for.

Towards the close of last century it was discovered that mammalian tumours could be transferred to new hosts of the same species by means of cell grafts, and in the earliest years of the present century grafted tumours came into use as material for cancer research. Mice and rats were the animals of choice. Irregularities in the number of "takes" early attracted notice and were rightly regarded as due in part to differences in host resistance. It was soon found that animals in which a graft had failed to take, or having taken had grown for a time and then had either regressed or been removed surgically, were often left highly resistant to further inoculations. Then it was discovered that grafting of homologous normal tissues, particularly of

normal skin, often left an animal similarly resistant, and hopes were high that along these lines a method of preventing or curing cancer might be found. But this has proved impossible. By about 1912 it had been clearly established that this kind of immunity, whether occurring naturally or induced by inoculation of normal or malignant tissues, was directed against cells as such, and was effective only when the cells of the test-graft had a strange or foreign character; it was immaterial whether or not the cells had malignant characters in addition. The degree of natural resistance observed was rightly held to be correlated with the degree of conflicting constitutional difference between graft and host, none being shown where there were no conflicting differences, as when an animal was grafted with its own spontaneous tumour. In 1911 we find Haaland[1] remarking on the delicacy with which the results of grafting with a given tumour would reveal constitutional differences in a group of mice. It was Haaland, also, who showed that along these lines—i.e., by injections of normal or malignant tissues—a mouse could not be immunized either against an existing spontaneous tumour or against the liability to develop one. Immune bodies resembling the antibacterial antibodies could not be detected in the blood of resistant animals, but Russell[2 3] was able to show the mechanism by which the resistance became manifest. He studied transplanted tumours in their earliest stages, and found that animals were resistant only in so far as, failing to supply the graft with an adequate stroma, they left its cells to die of inanition. Rous[4] showed that this same form of immunity was effective also against grafted normal cells, and thus completed the group of observations which together first proved conclusively that this form of resistance did not and could not arise in response to the presence of spontaneous cancer, did not affect the progress of an existing spontaneous cancer, and had nothing to do with the malignant qualities of cells.

It might have been expected, perhaps, that no further interest would be taken in this non-specific resistance, and that thenceforward the use of transplantable tumours would have been confined to investigations in which simple resistance to the presence of foreign cells could not mask reactions it was hoped to observe. But it was not so: little heed was paid to the warnings. Transplantable tumours were still freely misused, and so they continued to deceive; and still this non-specific resistance continued to form a prominent subject for so-called cancer research. Prof. W. H. Woglom, who is now head of the Department of Cancer Research of Columbia University, a department formerly better known as the Crocker Institute, took part in the early researches already mentioned and has retained a deep interest in transplantable tumours ever since. In 1929[5] he published a long and careful review of the relevant information which had accumulated in the literature since about 1913. He summarized the contents of some 600 published papers, and remarked that little of importance had been added to the findings and conclusions of the earlier workers. Now, in 1941, he still feels it necessary to reinforce and propagate knowledge of the true position by increasing the weight of evidence. With Eisen, he[6] records experimental findings which support and confirm those of several other recent investigators, including Bittner[7] and Lewis,[8] who have taken similar advantage of modern genetical knowledge and technique. They used mice belonging to two closely inbred strains. One strain was that called "August"; the other was the "990" strain, which differed from the "August" in being derived from a cross made many generations earlier between an "August" mouse and a mouse of another closely inbred strain. For the test grafts they used a mammary tumour which had appeared spontaneously in an "August" mouse and has proved highly sensitive to host constitution, because grafts grow in a full 100% of inoculated "August" mice, in some 60 to 70% of "990" mice, and in very few mice of any other strain. The experiments showed that "August" embryo skin induces no resistance at all in "August" mice, that "990" embryo skin does not appreciably increase the resistance of "990" mice, but that "August" embryo skin does increase the resistance of "990" mice to a notable degree. Thus once more, and now very elegantly, it is shown that only where there are differences in genetical constitution may natural resistance be found or induced resistance brought about.

It is not suggested that transplantable tumours have no good uses. Their cells certainly have malignant qualities as well as others, and under some conditions these are open to investigation. In 1903, for instance, Jensen studied a transplantable mammary tumour of mice and found clear experimental proof, the first of its kind, that the famous "aus sich heraus" dictum of Ribbert was true for this tumour, and therefore is probably also true for others. But the best modern opinion seems to be that, in general, if transplanted tumours must be employed in cancer research—as, for instance, when it is highly desirable to observe a number of animals all carrying nearly identical tumours—then the risks of deceptive non-specific complications can and must be minimized by the use of a closely inbred strain of animal and a tumour which has arisen spontaneously in an individual of the same strain. There are many suitable inbred strains of mice in existence each of which has been maintained by strict brother-sister matings for so long a time that similarity in genetic constitution between close relatives now approaches that which subsists between identical twins, and corresponding tumour grafts grow with little if any less certainty than autoplasts or metastases and cause little or no non-specific foreign-cell reaction.

To-day, however, interest is drifting away from transplanted tumours. Observation of spontaneous tumours of laboratory animals was never entirely supplanted, and new facilities for such and kindred investigations are now at hand. Inbred strains of mice are available—the strain "A" of Strong, for example—in which 96% of all breeding females eventually develop spontaneous cancer of the breast. Strains are also known in which spontaneous tumours of other sites develop with much regularity, and strains are known, too, in which the incidence of one or other of several different types of tumour is exceedingly low. Tumours which must be classed as spontaneous can be produced in a good proportion of mice by carcinogenic chemicals or by certain hormones, and tumours of the host's own cells can also be produced in fowls by filtrates of tumours like the Rous sarcoma No. 1 or in rabbits by filtrates of the Shope skin papilloma. In these filtrates, too, a "natural" cause of cancer lies open for study. At the moment, perhaps, the focus of greatest interest and activity lies around the problem of why some strains of mice are more susceptible to cancer than others, and to many observers the modern atmosphere of cancer research will be best characterized by the current investigations of the genetical, hormonal, and other factors responsible for such differences in incidence—and all of these investigations are being conducted without recourse to transplanted tumours.

1 *4th Sci. Rep. Imp. Cancer Res. Fund*, 1911, London.
2 *3rd Sci. Rep. Imp. Cancer Res. Fund*, 1908, London.
3 *5th Sci. Rep. Imp. Cancer Res. Fund*, 1912, London.
4 *J. exp. Med.*, 1910, **12**, 344.
5 *Cancer Rev.*, 1929, **4**, 129.
6 *Cancer Research*, 1941, **1**, 629.
7 *Amer. J. Cancer*, 1936, **28**, 121.
8 *Johns Hopk. Hosp. Bull.*, 1940, **67**, 325.

DIPHTHERIA PROPHYLAXIS

In a circular just issued the Ministry of Health draws attention to certain facts that are of importance to those medical men who are doing what they can to make the present drive for diphtheria prophylaxis a success. At the beginning of 1940 the Ministry drew attention to the growing popularity of alum-precipitated toxoid, and at the end of 1940 it undertook to make a free issue of diphtheria prophylactic to metropolitan borough councils and provincial local authorities. The laboratories which distributed the A.P.T. were informed that large-scale field trials had shown that a Schick-conversion rate of about 98% had been obtained with two doses of A.P.T. of 0.1 and 0.3 c.cm. at an interval of not less than four weeks, and this dosage was generally adopted. It was afterwards found, however, that one preparation of A.P.T. yielded a much lower Schick-conversion rate than 98%, although it satisfied the requirements of the regulations made under the Therapeutic Substances Act. The issue of this preparation was therefore immediately stopped, and steps were taken to recover any supplies already distributed. Tests carried out showed that the unsatisfactory results were due not to the relatively small dosages employed but to a fundamental defect in its antigenic potency. Tests made with A.P.T. prepared in a satisfactory way have shown that good results can be obtained with a dosage of 0.1 and 0.3 c.cm. at four to six weeks' interval between the two injections, but it is thought desirable to widen the margin of safety by increasing the dosage. It is therefore recommended that A.P.T. should now be given in two doses of 0.2 and 0.5 c.cm. The evidence on which this decision has been taken was presented by Prof. G. S. Wilson and his colleagues in the *Journal* of March 7 and of March 14, 1942.

In his memorandum Sir Wilson Jameson, the Chief Medical Officer to the Ministry, takes the opportunity of stressing the importance of immunizing children of preschool age as well as those of school age, and suggests that the advantages of immunization should be brought to the notice of parents and guardians of children approaching the age of 1 year. He recommends also that the practice of immunizing nurses in isolation hospitals should be extended to susceptible nurses who work among children in other hospitals, nurseries, etc. He suggests that for this purpose injection of toxoid antitoxin floccules (T.A.F.) is more suitable, as it gives rise to less reaction than does A.P.T. Three doses of 1 c.cm. each should be injected at intervals of three weeks, and any subject reacting to the control toxin in the Schick test should receive a first dose of not more than 0.5 c.cm. Although, Sir Wilson Jameson states, a Schick-negative reaction strongly suggests that in ordinary conditions the subject is unlikely to develop diphtheria, it does not exclude this possibility in nurses and other persons exposed to a high risk of infection. He advises, therefore, that all Schick-negative nurses should be given a stimulating dose of 0.5 to 1 c.cm. of T.A.F.

IDENTICAL TWINS IN DIFFERENT ENVIRONMENTS

The value of studies of twins in an approach to problems of Nature and nurture has not been in doubt since the days of Galton. It is only within the last twenty years, however, that painstaking efforts have been made to discover cases of identical twins reared apart, and, on the basis of careful physical and mental measurements, to attempt to discover the extent to which different environments can bring about differences in individuals identical in genetic constitution. Practically all this work has been done by H. H. Newman and his collaborators, who, following an initial case described by Muller,[1] collected no fewer than 19 cases.[2] These workers considered that the North American field was more or less exhausted as regards the present generation, for cases of early separation of identical twins are naturally rare. More recently, however, Newman and Gardner[3] have described another case. It is true that there are other occasional references in the literature to identical twins reared apart; one interesting example in which both twins developed schizophrenia has been described by Kallman,[4] and was mentioned in a recent leading article in these columns.[5] But so far as we are aware the cases noted above are the only ones in which thorough quantitative studies have been made, permitting, for example, a comparison of intra-pair differences between identical twins reared apart with the differences between those reared together. Particular interest attaches, therefore, to a case found in this country and very fully investigated by Nora Yates and Herbert Brash.[6] The twins were separated at the age of 3 months, being adopted by different foster-parents. They remained in ignorance of each other's existence for 16 years, when a series of mistaken identity incidents—both lived in the Glasgow area—led to a meeting and a discovery of their relationship. Press publicity brought the case to the notice of Yates and Brash, who carried out their investigations during a period of six months. The fact of identity is beyond doubt, the fingerprint patterns alone, apart from other evidence, affording sufficient proof of this. As these cases go, the differences between the boys are distinctly large. One twin, "J. B.," was decidedly superior in height, weight, and general health; he was more than an inch taller than his brother. But the other twin, "J. J.," was no less superior in intelligence, his Binet-Terman-Merrill intelligence quotient being 125 compared with his brother's level of only 106. As regards performance tests, however, the difference was much smaller. J. J. had been brought up in an urban environment, J. B. in one which was semi-rural. There was no very great economic contrast, though J. J.'s foster-parents were poorer than those of J. B. Altogether it is not easy to relate the obvious differences between the twins to any obvious difference in home surroundings. During the investigation J. J., without any premonitory symptoms, suffered from a perforated duodenal ulcer. In view of this it is interesting to find that the radiologist said that he had never seen two such similar stomachs as those of these boys. A characteristic peculiar to both was revealed by the ophthalmoscope—extraordinarily deep physiological cups in both pairs of eyes—while dental similarities were "amazing." (A remarkable instance of parallel medical history was described in last week's *Journal* (p. 607) by Dr. J. G. O'Brien, in his account of subarachnoid haemorrhage in identical twins.) Newman, in the paper with Gardner already quoted, sums up by saying that what has chiefly impressed him throughout has been the great intra-pair similarities after exposure to all sorts of environments rather than the intra-pair differences. In only 4 out of 20 cases did the differences exceed those sometimes found between identical twins reared together. Nevertheless, there can be no doubt that large environmental differences can produce on occasion proportionately large differences between individuals of identical genetic constitution. Such careful studies as that of Yates and Brash are extremely valuable in adding to the yet all too scanty material provided by these fascinating and regrettably rare cases.

1 *J. Heredity*, 1925, **16**, 433.
2 *Twins, a Study of Heredity and Environment*, Chicago, 1937.
3 *J. Heredity*, 1940, **31**, 119.
4 *The Genetics of Schizophrenia*, New York, 1938.
5 *British Medical Journal*, 1940, **1**, 261.
6 *Ann. Eugenics*, 1941, **11**, 89.

THE SCHOOL CHILD IN WARTIME

In his Chadwick Lecture on the School Medical Service in wartime, Dr. J. Alison Glover, late Senior Medical Officer, Board of Education, said that in the 31 years between the inauguration of the School Medical Service and the outbreak of the present war the Service had passed from ascertainment and treatment to prevention and was entering into a fourth phase, the search for "positive health," the appreciation "that it is the legislator's task to frame a society which shall make the good life possible" and so enable very child to reach the highest degree of health and development of which he is inherently capable. These phases are well shown in the changing outlook on diet in relation to health, from the ascertainment and treatment of malnutrition to the striving after optimum nutrition. In this period of 31 years the British school child underwent a metamorphosis for which, though many other factors had a share, the School Medical Service had been largely responsible. The school child of 1939 was bigger, more resistant to disease, cleaner, and in every way fitter to stand the strain of total war than his predecessor of 1908. Dr. Glover said that the health of the school child now after two and a half years of war is well maintained whether it be judged by clinical assessment of nutrition, average measurements of growth, the incidence of infectious and catarrhal diseases, the incidence of neurosis, or the general impression of doctors, nurses, or teachers closest in touch with school children. Vigilance is, however, necessary. The difficulties the Service encountered from evacuation naturally differed in the reception and evacuation areas. They were increased by the constant ebb and flow of the ceaseless "drift-back," by the interruptions of alerts, by shelter life, appropriation of schools for other purposes, and by the calling up for service with the Forces of doctors, dentists, and nurses. Among other points brought out in the lecture were the great development of the provision of meals and milk, the intensive campaign for immunization, the conversion of the camps provided by the National Camps Corporation into residential schools, and the great development of the provision for children under five years.

THE BIOLOGICAL SIGNIFICANCE OF VITAMIN E

Vitamin E was discovered through the harmful effects of its absence on gestation and on spermatogenesis. It is not surprising, therefore, that it should be commonly described as the "reproductive" or "sex" vitamin. Our more recent knowledge of the dystrophy of both skeletal and uterine musculature which occurs in experimental vitamin E deficiency indicates, however, that the sphere of action of the vitamin is by no means confined to the reproductive cycle. Support for this wider conception of the importance of vitamin E may be found in four papers by Adamstone of Urbana, Illinois. In caponized fowls vitamin E has been found necessary to ensure the effective action of testosterone in promoting development of the comb.[1] The brains of chickens with encephalomalacia induced by deficiency of vitamin E have been found to contain abnormally low amounts of cholesterol.[2] In chickens given diets deficient in vitamin E and containing sardine oil or cod-liver oil, reticulum-cell sarcomata have often been observed as a secondary effect of intestinal ulceration.[3] The author's earlier work on the occurrence of lymphoblastomata in chicks deficient in vitamin E is thus recalled.[4] The final paper of the series[5] discusses the possible importance of vitamin E in the metabolism of anthracene derivatives, among which may be included testosterone, cholesterol, vitamin D, and certain carcinogenic hydrocarbons.

While there is every probability that the metabolism of anthracene compounds may be indirectly affected by the presence or absence of vitamin E from the diet, there would seem to be no real grounds at present for assuming a direct and exclusive interaction. Morgulis, Wilder, Spencer, and Eppstein[6] have shown that in rabbits suffering from nutritional muscular dystrophy, presumably through lack of vitamin E, the cholesterol content of the brain is not reduced but increased. The evidence to support Adamstone's incrimination of vitamin D as the constituent of sardine oil or cod-liver oil responsible for carcinogenesis in the absence of vitamin E is not strong. Only with testosterone, therefore, can a plausible case be made out for the interaction of vitamin E with an anthracene derivative. As Adamstone suggests, there is much to be said for the current view that vitamin E, by virtue of its properties as an anti-oxidant, plays some part in the oxidative changes of fat and lipoidal substances. The presumed interaction of the vitamin with anthracene derivatives may well be incidental to this more general role.

1 *Arch. Pathol.*, 1941, **31**, 706.
2 Ibid., 711.
3 Ibid., 717.
4 *Amer. J. Cancer*, 1936, **28**, 540.
5 *Arch. Pathol.*, 1941, **31**, 722.
6 *J. biol. Chem.*, 1938, **124**, 755.
7 *Johns Hopk. Hosp. Bull.*, 1940, **67**, 189.

GYNAECOGENIC ACTION OF DESOXYCORTICOSTERONE

Inspection of the formulae for desoxycorticosterone and progesterone reveals a very close similarity between the two; the former, in fact, could be derived from the latter simply by the substitution of a hydroxyl group for a hydrogen atom at the C 21 position. The near resemblance in chemical structure naturally suggested experiments to determine possible analogies in biological activity. Investigations in the rat and rabbit confirmed both the progesterone-like activity of desoxycorticosterone and the cortin-like effect of progesterone. Speert[7] has studied the relationship in so far as it applies to the primate. He finds that in the mature castrate female Rhesus monkey, synthetic desoxycorticosterone acetate, administered in a dosage of 10 mg. daily, stimulates the secondary sex organs, increasing vaginal desquamation, restoring sex-skin coloration, and causing lobule-alveolar growth of the mammary gland. Progesterone has the same effect upon the mammary gland, but acts in the opposite sense upon the sex skin and vaginal desquamation; the biological activities of the two compounds are therefore not so closely analogous as in certain other species.

Our *Supplement* this week contains a comprehensive statement on petrol allowances for doctors. The abridged Annual Report of Council will appear next week, and it is hoped to publish the interim report of the Medical Planning Commission on June 20.

We regret to announce the death at the age of 89 of Sir Thomas Oliver, consulting physician to the Royal Victoria Infirmary, Newcastle-upon-Tyne, ex-President of the University of Durham College of Medicine, Newcastle, and Vice-Chancellor of Durham University 1928-30. He was a pioneer worker on industrial poisoning.

War Surgery of the Extremities

This is one of a short series of articles based on lectures given at the British Postgraduate Medical School, Hammersmith

WOUNDS OF JOINTS

BY

V. ZACHARY COPE, M.D., M.S., F.R.C.S.

Joints are mechanisms which permit movement between the various parts of the skeleton; the freest movement is needed between the segments of the limbs, and it is there that the largest and most complicated joints are found. I shall here deal only with the diarthrodial joints of the extremities, for wounds involving amphi-arthrodial and synarthrodial joints are usually less important than the fractures which always accompany them. In the case of fractures we need immobilization of the limb in order to permit union to take place, but we have a different object when a joint is injured—i.e., to conserve as much movement as may be possible. It follows that different time periods are needed for the immobilization in the two cases. When a fracture does not unite we are disappointed and know that we have failed; when fixation occurs at a diarthrodial joint we know that we have failed to attain a perfect result, though we may have obtained the best one possible.

Before describing the different types of wounds we should recall the structure of a joint, which consists of the two cartilage-covered ends of two bones separated by a synovial sac and united by a capsular and accessory ligaments. Surrounding muscles and tendons support and strengthen the articulation. The most important parts of the joint are the synovial sac and the articular cartilage. If these can be kept intact or if they are only slightly damaged, then movement may be preserved; but if they are seriously injured mobility at the joint is always greatly impaired or is lost. That fact is of the utmost importance in directing our treatment of injuries of the joints.

The synovial membrane has a certain limited resistance against infection; but once infective organisms have gained a hold in the joint, mechanical drainage and antiseptic irrigation cannot be trusted to succeed in getting rid of the infection. Indeed, they may sometimes make matters worse by still further irritating the already damaged serous membrane, thereby leading to the formation of a further amount of granulation tissue. If we are to preserve mobility we must minimize the formation of granulation tissue, which will later be converted into scar tissue and limit movement at the joint. Thus the moral is that drainage tubes should seldom or never be inserted into the cavity of a joint.

For purposes of description we may classify wounds of joints into the following groups: (1) penetrating wounds of civilian type; (2) perforating bullet wounds (through-and-through type); (3) bullet, bomb, or shrapnel wounds in which the fragment is retained in the joint; and (4) severe wounds in which the articular surfaces are badly injured.

Diagnosis of Type of Wound

As a rule the type of wound is easily ascertained. One may see the small punctured wounds of entry and exit made by the high-velocity sharp-pointed bullet, or there may be only the one small puncture where it has entered. Remember that if the line of trajectory were oblique the exit wound might be found far from the joint in another part of the limb. With many cases in Group 3 and most of those in Group 4 there will be a lacerated wound of the soft parts and the skin. At the first dressing it will be impossible to tell exactly what damage has been done to the bones, but before any operative treatment is undertaken an antero-posterior and a lateral radiograph should, if possible, be taken to show the extent of the injury.

First-aid Treatment

In all joint wounds the wound must be protected from further external infection and the joint immobilized. In addition it is usually necessary to give antitetanic serum and treat general symptoms such as shock and pain by the appropriate methods. Moderate haemorrhage may be controllable by local pressure produced by bandaging, but if the main vessel of the limb, such as the popliteal artery in the case of knee injury, is bleeding, then a tourniquet must be applied temporarily.

A first-aid aseptic or antiseptic dressing should be applied without unduly disturbing the wound. Immobilization should be attained by splinting, if possible. For the lower limb a Thomas knee splint is satisfactory, while for the upper limb a Jones or an angular splint may be used. Failing the availability of splints the upper arm can be bandaged to the body and the lower limb splinted by the adjacent good limb. No further treatment is needed until the patient is placed under good conditions for adequate surgical procedures. These procedures vary according to the type of wound.

One of the advantages or penalties of seniority is that during the last thirty years one has seen many changes in the treatment of open wounds of joints. Thirty years ago the importance of complete immobilization was not generally recognized, drainage of the joint cavity by rubber drainage tubes was thought to be efficient, and many believed that antiseptics had a more powerful action than they actually have in ridding infected tissues of microbes. Incision, drainage, and irrigation were the methods adopted at the beginning of the last war. In the *Official History of the Great War* Col. Frankau has well summarized the results of such treatment:

> "The results of these methods were lamentable: the death rate for the larger joints was very high, the amputation rate was enormous —60% for knee-joint cases uncomplicated by injury to bone, and at least 80% where there was an associated fracture; and the functional results in those limbs that were saved were almost invariably bad as regards movement."

It was largely due to the work of the late Col. H. W. M. Gray that the new methods of immobilization, excision of infected soft parts, and lavage of the joint cavity, followed by closure of the capsule, led to great improvement in the results. After three years of war more than four-fifths of the joint wounds were healing by first intention without suppuration, and the amputation rate at the bases was down to 7%. Since the last war our resources have been increased by the discovery of the sulphonamide group of drugs, and our experience has been enriched by the work of Trueta, who showed that the technique of Winnett Orr could be applied to war wounds of joints.

We will now consider the treatment which may be applied to each of the types of wounds.

Penetrating Wounds of Civilian Type

When any blunt or pointed instrument pierces a joint there is almost always some infection carried in, but often the tissues can deal with this so long as they are not disturbed. Unless the instrument is known to be perfectly clean (as, for instance, when a sterilized scalpel accidentally punctures a joint) it is wise to excise the edges of the wound down to the synovial sac and to put a narrow drain down to but not into the joint. The limb should then be completely rested either on a splint or in plaster-of-Paris casing; if the temperature remains approximately normal and pain is absent the plaster may be removed in a few days and gentle movements of the joint encouraged.

If complaint of pain, onset of fever, and swelling of the joint make it clear that infection is developing, one of the sulphonamide group of drugs should be prescribed and aspiration of the joint performed to relieve tension and to obtain a culture of the organism responsible. It is important to know the nature of the organism, for it is well known that members of the sulphonamide group vary in their power of combating the different microbes, and, in addition, the surgeon may wish to have an autogenous vaccine made to help the cure. If these measures fail to stop suppuration in the knee-joint it will be necessary either to perform repeated aspiration or, preferably,

to make a free incision lateral to the patella, and sometimes postero-laterally in front of the biceps tendon or adductor magnus tendon, and immobilize the limb in plaster. A tube should not be put into the joint. Only in very rare instances will these measures fail to bring about cure. If they do fail, there ensues a condition similar to that which often follows the more serious wounds described below.

Perforating High-velocity Bullet Wounds (Through-and-through)

If a modern bullet travelling at a high velocity goes right through a joint without injuring the bony articular surfaces it may cause little disturbance and no appreciable infection, and, provided the limb be kept at rest, may result in rapid healing, with retention of good movement in the joint. If when rested pain, fever, and swelling remain absent there is no need to interfere. If seen soon after infliction the wounds of entry and exit may be excised down to the synovial sac and the tissues sewn up; if the case comes to hand many hours after infliction of the wound and no untoward symptoms have developed, then it is best to leave well alone.

When a bullet traverses the joint and seriously injures the bony articular surfaces there may be considerable effusion of blood into the joint cavity, and bony fragments may be loose in the joint. It is very tempting to open such joints with a view to removal of loose bits of bone, but I think we must here accept the teaching of Trueta, who has had great, and recent, experience of these cases. Speaking of a bullet wound of the knee-joint in which no foreign body has been retained in the joint, he says:

> "Even when a bullet causes a comminuted fracture in the inferior articular surface of the femur the case follows an entirely favourable course when it is treated immediately in a plaster case from pelvis to toes. Healing is complete within three months; some mobility of the joint is usually preserved, and it is rarely that gross permanent stiffness of the knee persists."

Gunshot Wounds with Foreign Body retained in Joint

When a portion of bomb, bullet, or shrapnel is thought to be within the joint, either because there is only a wound of entry or because the radiographs show it to be there, then operative treatment is almost always indicated. An anaesthetic should be given, the wound of entry carefully excised, another clean scalpel used to open up the joint further, careful search for metal or bits of clothing made, all severely damaged soft tissue excised, and the joint cavity washed out with acriflavine (1 in 1,000) or with Dakin's solution and then closed by a few catgut sutures through the edges of the synovial membrane. The skin may be sewn up, leaving a drain down to the exterior of the synovial membrane. The limb is then immobilized in plaster. Knowing the local antiseptic properties of sulphanilamide one would be justified in insufflating a little of the powdered drug on to the interior of the joint, but this is not so important as complete rest to the limb after the operation. If, after this, infection should occur, it may be necessary to open up the incision to allow free escape of discharge from the joint, but the plaster should be reapplied and sulphanilamide given by mouth. If, in spite of this, infection progresses it will be necessary to consider amputation.

Severe Lacerated Wounds with Badly Injured Articular Surfaces

The most serious cases are those with a large open wound exposing the articular surfaces, which are in some instances broken into fragments and contaminated by debris of various kinds. There is often extensive damage to parts around the joint, and if the main vessels of the limb are destroyed and the joint badly smashed amputation may be necessary. If the main vessel be intact one should almost always give the joint a chance to recover. In these cases shock is often severe and soiling of the wound extensive. The limb is immobilized from the very first, and shock has to be treated before operation is undertaken. Antitetanic and anti-gas-gangrene serum should be administered. When the patient is considered fit enough an anaesthetic is given and toilet of the wound performed. This consists in cleansing the surrounding skin, excising the edges of the wound down to the interior of the joint, complete opening up of the interior of the joint, and removing contaminated and separated pieces of bone, followed in some cases by irrigating the surfaces by an antiseptic which does not injure the tissues—e.g., acriflavine 1 in 1,000. If it be thought that infected tissues have not been thoroughly removed there would be justification for the local application of sulphanilamide powder. The synovial membrane is closed in part, but a portion should be left open for drainage. The whole limb should then be encased in plaster-of-Paris or, if plaster is not available, in a suitable splint.

This wound toilet, as I have described it, comprises several separate acts, and there is no one word which sufficiently describes the technique. The term "débridement" has lately been loosely, and I think incorrectly, used to designate the whole technique, but it would be a pity if this were allowed to become current usage. The word "débridement" (from the verb *débrider*, which means to incise or slit up) had, until the last war, been used by the French from the time of Larrey and by the Germans in their account of the surgery of the Franco-Prussian War, to indicate a slitting up of the wound in order to procure better drainage. In recounting some of the lessons of the war of 1914–18 Bainbridge (*Military Surgeon*, 1921, **49**, 379) wrote as follows:

> "It is more than likely that the Germans profited by the experience of French operators; . . . for the principle of extensive exposure of all wound angles, tracts, recesses, and cavities (the famous French débridement) with unobstructed drainage—in other words, the creation of physical conditions favourable to wound repair—was soon emphasized on the German as well as on the Allied side."

Lately several writers have extended the term "débridement" to include the excision of the soiled and damaged tissues of the wound. This was not previously included in the meaning of the word, and although one recognizes that the significance of words often changes with the passing of time, this change seldom does and never ought to occur with terms of definite meaning which are used by those who are trained scientifically. The term "wound toilet" would be a useful one for the whole process which I have described.

Further treatment depends upon the course of the infection, but in most cases repeated change of plaster is all that will be necessary. Only when all evidence of infection has disappeared should any attempted movement be permitted at the joint. If suppuration continues and extends it will be necessary to consider amputation of the limb.

When should Amputation be Performed?

There is no doubt that in the last war many lives were lost because surgeons often tried to save limbs when the patients were rapidly losing ground owing to the general effects of infection. When, in any joint, the suppurative processes continue to extend in spite of adequate drainage, and if the general condition of the patient as shown by fever, loss of appetite, wasting, sleeplessness, and general appearance makes it obvious that the infection is undermining the strength, then amputation will be needed. I can hardly recall a case in which I regretted amputation in these conditions, but I can remember, regretfully, one or more instances in which I delayed too long before performing it.

Excision of joints has little or no place in the treatment of joint injuries; it may be necessary to excise the head of the femur to produce better drainage of the hip-joint, or the head of the humerus the better to drain the shoulder-joint, and informal excision of loose contaminated fragments of bone may from time to time be required in the primary operation, but apart from these instances excision is more often needed to correct deformity at a later stage.

Prognosis

The outlook is better in the case of the joints of the upper extremity, for here the synovial sacs are not so complicated and drainage is rather more easily procured. Infected wounds of the hip and knee are most serious. At the end of the last war more than four-fifths of joint injuries of all kinds which were treated by early and free excision of the wounds healed

without suppuration—a truly remarkable improvement on the condition of affairs at the beginning of that war.

When it is seen that ankylosis must necessarily occur in a joint which has been injured, one should, so far as is possible, obtain that position which can be most useful to the patient. In the case of the elbow, the optimum position for ankylosis is just beyond a right-angle; for the shoulder, there should be slight flexion and external rotation with 60 degrees abduction; the wrist should be slightly dorsiflexed, the hip slightly abducted, the ankle at a right-angle with the leg, and the knee extended straight.

In this account of the treatment of wounds of joints I have made little reference to several methods which were in common use during the last war: continuous irrigation by the Carrel-Dakin method, the insertion of bipp into wounds, the use of strong salt solution, and other techniques were proved of value in these cases, but none of them has definite advantages over the plaster-immobilization method as outlined by Trueta. In cases in which for one reason or another plaster is not available these other methods may be tried, and will often be successful. The internal administration of sulphanilamide has certainly to a large extent ousted the treatment by autogenous or stock vaccines, though in difficult cases one should always have recourse to treatment by autogenous vaccine.

MEDICAL AID POSTS IN LONDON SHELTERS

Temporary Closure

As few people are now using public shelters in London and the most dangerous season for epidemics has passed, nearly all the shelter medical aid posts in the London Civil Defence Region are to be temporarily closed and put on a care and maintenance basis. Only the posts in the shelters or groups of shelters which are still regularly used by 500 persons or more will be kept open. This decision has been taken by the London Civil Defence Commissioners with the approval of the Ministry of Health.

Medical aid posts and regular medical and nursing attendance have been provided in every public shelter or group of public shelters regularly used for sleeping by 500 people or more since the beginning of the winter of 1940-1. The main object was to prevent the spread of infectious disease among the larger aggregations of shelterers. Now that the number of regular users has in most shelters fallen well below 500 it is considered that there is little or no need for these regular health services. The majority of the 203 medical aid posts recently in operation were regularly attended by doctors and were staffed by 390 nurses. The number of shelterers, however, has shrunk to 8,600, an average of only 43 persons per post. Only 4 cases are, on the average, being treated each week at each post. Doctors will continue to be available on call to deal with emergency cases of illness or accident in the shelters.

The Commissioners have asked the local authorities to arrange to maintain the medical aid posts in proper condition, and the local medical officers of health will continue to supervise health conditions in the shelters generally. All practicable steps will be taken to ensure that the full shelter medical organization can be brought into operation again at short notice if the need arises. For example, arrangements are being made for suitable nurses released from shelter work to be employed in hospitals or on other work under their own local authority on condition that they are released at short notice if required again for shelter duties.

E. L. Taylor (*Vet. Rec.*, 1942, **54**, 95) gives a short account of phenothiazine poisoning in horses, to which the drug is often given as an anthelmintic. Symptoms may appear within 6 hours of administration, and consist of restlessness or dullness, a quick, weak pulse, colicky pains, diarrhoea or constipation, jaundice, and profound muscular weakness. One of the most prominent effects, he states, is the destruction of red blood corpuscles. Mr. Taylor believes it to be not improbable that occasional susceptibility to this drug may be related to the diet of the animal. In treatment, calcium gluconate and methylene blue have been given intravenously, and blood transfusion has also been resorted to. As the incidence of phenothiazine sensitivity is low the author does not recommend that its use should be discontinued; thousands of horses have been treated without ill effect.

Correspondence

Child Health

SIR,—There is a risk that the article by Prof. Charles McNeil (April 4, p. 429) may give public health workers an exaggerated idea of their own importance. When our local infant death rates fall to 31 per 1,000 live births (as was the case in several extra-metropolitan boroughs in 1939) are we justified in claiming it as a triumph for the child welfare service? I have never considered it to be so, but Prof. McNeil's article suggests that certain reforms he advocates in our present system of infant health control in Great Britain will result in reduction in our infant mortality to the low rate present in Holland in 1938. This would appear to be an over-simplification of the problem. One notes from Prof. McNeil's chart that the Dutch infant mortality had overtaken the English and Scottish rates by 1910 (before the maternity and child welfare services were in being). The Dutch figures established increasing superiority over the English rates from 1920, and Prof. McNeil considers it is significant that the States of the Continent spared by the 1914–18 war have all much lower infant death rates to-day than those that were engaged in it. The position after this war may be much less fortunate for Holland.

In the years when the English infant mortality was higher than the Scottish rate—i.e., until 1910—epidemic diarrhoea took a heavy toll of child life in England. In 1906 Newman stated that it was the most destructive of all diseases attacking children under 5 years of age. It was never such a scourge in Scotland, so that the dramatic improvement in the English rates when summer diarrhoea disappeared did not occur in Scotland.

In looking for an explanation of Holland's present superiority over England and Scotland in infant mortality Prof. McNeil says, "Climate can hardly have much to do with it," but he allows a "harsher climate" in Scotland as one of the factors which may explain the higher infant mortality there compared with England. The Registrar-General's Statistical Review for 1937 gives the rate for England and Wales as 57.6, the rates for the East, South-East, and South-West as 46.1 to 49.7, for the Midland areas as 57.3, and for the North as 67.7. This steady rise in infant mortality from the South of England to the North, whose figure of 67.7 in 1937 approaches very near the Scottish figure of 70 in 1938, suggests that climate may have something to do with infant mortality, and that the Continental climate which Holland enjoys may be kinder to infant life than even the South of England. The Registrar-General's Review shows also that infant death rates from measles, whooping-cough, bronchitis, and pneumonia rise from the South of England to the North.

Scientific work has been done which suggests that deficiency of calcium and deficiency of iron both result in lessened resistance to infection. If, as Prof. McNeil states, "the prevention of infection lies in a general strict technique of sanitation in the city, the street, and inside the home," we ought to have been overwhelmed with infection in the early days of air raids and communal shelters. Prof. McNeil suggests that for the improvement of child health to the level reached by Holland we should concentrate our attention on two main objectives: (1) the prevention of infection in infancy by improved domestic hygiene; (2) the improvement of infant feeding, especially in the first month of life. I should expect even more striking results from a rise in the standard of living and a reduction in overcrowding and other defects of urbanization. The degree of overcrowding in the larger Scottish towns is considerably greater than in the English towns, and this undoubtedly has an adverse effect on child health.

There is likely to be disagreement among different sections of the medical profession as to how far Prof. McNeil's criticisms of the child welfare services are justified, and which of his suggested reforms would result in improvement in the service. He is surely in error when he states that the essence of the service is a chain of clinics. The essence of the service is regular home visits by the health visitor. The proportion of her time spent in clinic work varies from place to place: 2/11ths to 3/11ths, which is the proportion in the borough in

which I work, does not justify Prof. McNeil's statement that in practice she is a public health nurse rather than a home health visitor. No one would quarrel with the suggestion that improved training would benefit all of us. Prof. McNeil is dissatisfied with the present training of the health visitor, and states that it does not make her a competent infant dietitian. He adds that most of the chronic dyspepsias of infancy begin in the first month of life from mismanagement of breast- and bottle-feeding. Surely he would agree that the responsibility for this early mismanagement must rest with the attendant at the confinement—doctor or midwife. The health visitor starts her visits when the baby is fourteen days old (unless the midwife has asked for her earlier assistance with feeding problems, which unfortunately does not often occur), and where progress is unsatisfactory she must try and effect improvement, and at the same time avoid contradicting advice given by the doctor or midwife. The training in and knowledge of infant feeding of the midwife and the average general practitioner are much less extensive than those of the health visitor.

Prof. McNeil states that our obstetrics are good, but in the table he gives, which shows stillbirth and neonatal death rates in 1938, Holland's combined figure is 46 and England's is 64, so that if he considers the figures for the two countries at all comparable (which may not be justified) there appears to be room for improvement in the English figure. He describes these deaths as "obstetrical deaths," which is a little hard on the obstetrician, because a proportion follow toxaemia in the mother and others result from congenital maldevelopment of the foetus or an extreme degree of prematurity.

Before it can logically be assumed that any lag in the fall of infant mortality of England, Wales, and Scotland compared with the fall in other countries is due to "lack of knowledge on the part of nurses and doctors responsible for the welfare of infants after birth," a careful analysis of factors associated with infant mortality must be made. These factors include poverty, ignorance, urbanization, sanitation and housing, overcrowding, climate and changes in temperature, atmospheric pollution, racial constitution of the population, sex ratio of births, birth rate, illegitimacy, ill-health or disease of expectant mothers, nature of feeding, and employment of married women. Only when these are broadly comparable in the countries concerned can a fair comparison of their obstetrics and paediatrics be made. The fact that there is such wide variation in infant mortality in different parts of England and Scotland would almost justify the assumption that education of the preventive health services is not the solution.

It is interesting to note that 80% of Dutch babies are born at home. In England and Wales the percentage in 1937 was 66.—I am, etc.,

Leyton, E.10. HILDA F. MENZIES, M.D., D.P.H.

The Midwife and Child Health

SIR,—No one can be more whole-hearted in her admiration of the splendid work of the midwife in her own sphere than I am. Perhaps I may therefore be allowed to question the wisdom of assuming that she is also the most expert adviser of the mother available in matters of paediatrics and infant feeding. The health visitor willingly yields the nurse's realm of practical obstetrics to the midwife, but the latter would seem on very doubtful ground if she claims that her knowledge of infant feeding is superior to that of the health visitor.

A better solution of the difficult problem, quoted by the president of the College of Midwives (May 9, p. 596), when the mother weans her baby between the last visit of the midwife and the first one of the health visitor, would appear to be to improve the liaison between these two skilled officers, both of whom are anxious to encourage breast-feeding. Should not the midwife hand over her case officially to the health visitor, so that there is no hiatus between their visits? It seems likely that an atmosphere of closer and more friendly collaboration between midwife and health visitor might do much to prevent the mother from resorting to the unskilled advice of her friends. A valuable innovation would be for the midwife to call in the health visitor in consultation when there is difficulty in feeding before the fourteenth day.

Even if the midwife continues to supervise her cases for a month there will still be a hiatus, with the risk of premature weaning, unless she makes it a point of professional etiquette to see that her cases come under the care of her colleague. On the whole it may be submitted that as the health visitor supervises the subsequent care and feeding of the child, it is probably wise for her to take over this care as soon as the mother has ceased to require the midwife's services, which are better employed in obstetrics.—I am, etc.,

VIOLET RUSSELL.

Serodiagnosis of Syphilis

SIR,—I welcome Dr. Nabarro's letter on the above subject (May 9, p. 591), although I should have thought that the problem was of as much importance here as in the U.S.A.

I am continually seeing cases in which "false positive" reports have caused great distress. A short time ago I saw an Army officer who, with no symptoms of syphilis and apparently on the strength of a "weakly positive" reaction, was told he had syphilis. His wife was then tested at the same laboratory, and he was told that she gave a positive result and also had syphilis and ought to have treatment. Both of them gave negative Wassermann and Kahn reactions in two different laboratories on being retested, and neither had any history or signs of syphilis. The clinician had accepted the laboratory report, and had the above man not been insistent and sensible enough to seek other advice he and his wife would have been subjected to prolonged treatment, to say nothing of the mental misery which the diagnosis must involve. Such happenings I find all too frequent.

I quite agree that the check on serodiagnostic tests should be efficient and regular. There are some laboratory workers who resent it, but surely this is an unsupportable attitude; if the tests carried out in a particular laboratory are reliable no harm has been done, and if, on the other hand, they are not reliable, the sooner the mistakes are remedied the better for everyone concerned.

Many laboratories work in a "shut-off" area, away from clinical co-operation, and the pathologist fondly imagines that his reports are of the highest standard; such a position is as deplorable as that of the clinician who also fondly imagines that his genius enables him to diagnose and treat syphilis without the aid of a serological test. I am sure it is of vital importance that a laboratory which undertakes Wassermann reactions should not only be kept constantly checked as to its results but should be also in the closest touch with V.D. clinics (ordinary hospital co-operation alone is certainly not sufficient), where a regular survey and scrutiny of results, by clinician and pathologist together, ought to be done. No one can claim 100% efficiency for Wassermann tests, and "accidents" will happen occasionally from numerous causes, however careful one might be, but every safeguard, whether by supervision or co-operation, is, in my opinion, greatly to be desired.—I am, etc.,

Birmingham. ERIC ASSINDER.

Intrapartum "Death"—Cardiac Massage—Recovery

SIR,—It is with a deep sense of gratitude for recent articles in the *Journal*, more particularly that by Major J. C. Nicholson (March 21, p. 385), that I beg to report the following case, which I trust may be of help to others.

A woman aged 25 had asked me to attend her during her second confinement. The pregnancy was normal, her blood pressure never exceeded 118/72 mm. Hg, there was no albuminuria, and cardiac examination revealed no abnormality.

At 11 a.m. labour began, and after twice seeing her I sent her at 8 p.m. into a nursing home as previously arranged. I was sent for, and arrived at 10 p.m. to find the nurse holding back the head. Removing my jacket and donning a face-mask, I handed a 1½-oz. bottle of chloroform and Schimmelbusch mask to the sister, who administered it, and proceeded with the aid of a sterile towel to deliver the head. I now had time for a very brief washing of hands before the next pain arose, and delivery of a living child was completed at about 10.9 p.m.

The sister now called my attention to the mother, whose pulse and respiration had suddenly and completely ceased. She was a good pink colour, but quite pulseless at both wrist and apex beat; her pupils were widely dilated, and the eyes had lost their tension; cyanosis gradually developed. For a brief spell I applied artificial respiration, and then attempted cardiac massage through the abdominal wall—both without effect. Meanwhile Sister had run upstairs on my urgent request to fetch a scalpel, which fortunately lay in the

store cupboard, though it had not been used for at least three years. It was handed to me at 10.12 p.m.; a hurriedly made 3-in. rectus-splitting left upper paramedian incision opened the abdomen; my right hand, without further washing, was inserted, and the heart was massaged through the diaphragm. As there was no response I again took my scalpel and incised upwards directly behind the xiphisternum; at the third attempt I was able to thrust my right thumb up in front of the heart, which I could then grasp between thumb and fingers. It was quite motionless—apparently, though in the anxiety of the moment it is difficult to be sure—in a state of systole (this, I think, could easily be explained by my previous attempts at massage).

Rhythmic compression and relaxation produced an almost immediate response, and now for the first time in a period of between 5 and 6 minutes, at 10.15 p.m., the pulse was again easily palpable at the wrists. It was regular, of good volume, and at a rate of 120 a minute. Breathing started again spontaneously and immediately; and the lips again became a good pink colour. There was slight frothing at the mouth, and some retching. The pupils had now returned to normal size; a convergent squint developed and persisted for about 10 minutes. Now a general urticaria, consisting entirely of small wheals between 1/8 in. and 1/16 in. in diameter, arose, to fade gradually after about half an hour. Still later slight oedema developed in the eyelids.

At 10.30 p.m. the placenta and membranes were delivered without mishap; and at 10.45—exactly half an hour after the heart had resumed its beat—consciousness began to return. The patient was drowsy but took a lively interest in the news of her daughter's arrival. She complained bitterly of the "tightness of her brassière," which she said was giving her a pain at the heart.

At 11.15 p.m. a general anaesthetic—gas and oxygen—was administered by my colleague Dr. G. N. Box, and the abdominal wall was repaired in layers, after first introducing sulphapyridine powder above the left lobe of the liver (a small cut in which was not bleeding) and into the wound itself. A drainage tube was also inserted.

Morphine, 1/4 gr., was administered, and thereafter 1/6 gr. every four hours through the next day. Sulphapyridine, gr. 15, was given by mouth at four-hourly intervals.

At 8 a.m. the following morning the patient was sitting up in bed drinking tea and eating a little breakfast. She had pain both back and front of the left side of the chest, noticeable on breathing. Her pulse rate was now 100 a minute.

At the time of writing these notes, 36 hours after her ordeal, she remained extremely well and had shown no pyrexia. She has since made an uneventful recovery.

In conclusion, I would comment, first, as to the cause of her collapse. One ounce of chloroform had been poured on the mask in the course of about four minutes; some had run off on to the bed, and some produced vesicles of the left cheek on the following day. Secondly, I did not waste time giving injections of coramine or adrenaline. My patient was "dead," and my only thought was to adopt at once the most certain remedy at my disposal. Thirdly, I believe the rapid and complete return of consciousness to be due to the fact that cessation of heart beat and respiration occurred absolutely suddenly with the capillary blood as fully oxygenated as in health, and, although for five or six minutes the heart was not beating, it was probably for a slightly shorter period that the vital cerebral cells were deprived of their necessary supply of oxygen.—I am, etc.,

ALAN M. EASTON.

The Problem of Abdominal Pain

SIR,—Mr. Francis R. Brown (May 2, p. 543) has presented a fascinating study of the problem of abdominal pain. Such purely clinical research is most refreshing in these days of so much test-tube and laboratory work.

There is one observation in the double hernia case that does not appear to give support to Mr. Brown's conclusions. He states: "Pressure on the femoral hernia elicited pain." The site of the pain is not recorded, but it appears from the context to be in the femoral hernia. If it is true that "sensations produced in tissues which have been developmentally or artificially displaced from their primary relative positions and which retain only their original innervation are invariably localized in the respective primary relative positions of those tissues," then one would expect the pain to be "felt" in the umbilical region.

In view of the absence of hyperaesthesia, hyperalgesia, and muscular rigidity it would be safe to preclude the possibility of a peritoneo-cutaneous reflex.—I am, etc.,

Carmarthen. J. R. E. JAMES.

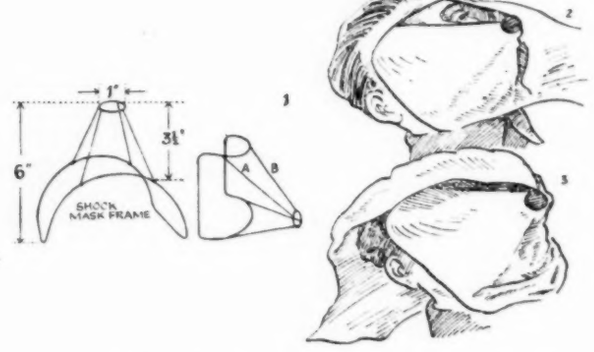
Shock

SIR,—Much thought and care are being given in hospitals to cases of shock occurring during air raids, but I have been greatly perturbed by seeing these cases lying in the open, losing valuable heat from the face and nose, especially by exhalation, throwing out into the cold air one of the much-needed aids to life. Accordingly I would like to suggest the following.

1. "Pig-snout" shock mask without frame. Lie the patient's head upon an open, fairly stiff triangular bandage with the base on a level with the top of the collar. Bring first one end of the bandage completely around the head, over the chin, and then the other end in the opposite direction, and tie at the back of the neck. Raise the bandage from the nose and mouth so as to make *as big an air space as possible*. Then bring the point over the head to enclose the space left over the face. Finally, fold and crease the point back underneath so as to leave an aperture of 1 inch diameter directly over the patient's mouth.

2. "Pig-snout" shock mask with frame. Rustless wire 1/16-inch gauge is bent as shown in Fig. 1 and a triangular bandage is lightly sewn around the ring and along the struts A and B of the frame, with one end turned under. The frame is then placed over the face so that the two curved ends rest upon the junction of the patient's lip and chin and upon his forehead (Fig. 2). The free end of the bandage is carried around the head with the base on a level with the collar. The point is brought over the head so as to cover the open side of the mask, but not the aperture (Fig. 3). Finally, the free end is brought firmly around the mask and then pinned.

The advantages claimed are: (*a*) Protection from cold air and wind. (*b*) Loss of heat by radiation from the face is minimized. (*c*) The face is warmed by exhaled air. (*d*) Heat is conserved by rebreathing warm moist air. (*e*) Rebreathing of carbon dioxide stimulates respiration (which in turn promotes the circulation). (*f*) Frequent inspection of the face is easy. (*g*) Fluids can be given by means of a tube and feeding-cup without removal of the mask. Naturally these masks must not be used in cases of air hunger. To obviate the patient's being mistaken for necessarily a head injury the triangular



bandage used as a shock mask (without frame) should have a label attached to it with the word "SHOCK" printed in large letters. The shock mask (with frame) should have printed on the free end of the bandage the words "SHOCK MASK" in large letters, and "Undo this pin first" in smaller letters for the benefit of those not used to the mask.

Our routine for shock cases on a stretcher is: (*a*) Four hot-water bottles to be placed in the axillae and on the groins (where the blood vessels are superficial). (*b*) Forearms flexed to an angle of 70 to 80 degrees with the arms and resting against the sides of the chest to tilt some blood out of the forearms. (*c*) After blankets have been applied in the orthodox manner the head is kept low and the feet raised by anything available to tilt blood out of the lower limbs. (*d*) Shock mask applied. (*e*) Very frequent drinks, preferably hot, as soon as possible, if necessary by feeding-cup and tube, or Sister Vetlesen's douche can (*Journal*, Nov. 8, 1941, p. 680), but not in cases of penetrating abdominal wounds. (*f*) Stretcher kept level to minimize the heart's work; when it must be sloped the foot end is raised. (*g*) Where possible shelter from cold winds. Emphasis

is placed on speed of evacuation and on extreme gravity of shock. It is the next most important thing to severe haemorrhage, which is, relatively, not often seen. One wonders if sufficient fluids are being given. Copious drinks are required to mitigate the low blood pressure. Cold drinks are far better than none at all to keep the patient alive until a transfusion can be given later in hospital.

For diagnosing shock the following "alphabetical" tip may be useful for first-aid workers:

Pulse	Rapid
Respiration	Shallow
Skin	Too cold and clammy
Temperature	Under normal
Unconsciousness (of all degrees)	Vomiting (perhaps)

I need hardly add that these suggestions for treatment are meant to relate only to first aid rendered at "incidents."—I am, etc.,

MAURICE E. J. PACKER.
M.O., No. 1 Clifton M.U.

Bristol.

Inefficient Steam Sterilization

SIR,—Further to the annotation in the *Journal* of April 18 (p. 500) and the letter of Prof. E. G. T. Liddell (May 9, p. 593), the penetration of steam heat can also be checked by using indicator papers. These are prepared by painting slips of paper with the following solution: starch, 1 oz.; iodine, 10 gr.; potassium iodide, 7 gr.; water to 20 oz. These slips are introduced into the bundles and are bleached at 113° C., a temperature at which all organisms are destroyed after 20 minutes. The simplicity and cheapness of this method are obvious.—I am, etc.,

M. E. GORDON.

Time for Sterilization

SIR,—I was very pleased to see Prof. Paterson Ross's commonsense references to the length of time required to sterilize instruments by boiling (May 9, p. 589). The average surgeon and nurse insist on boiling instruments before operation for the traditional 20 minutes, but if an instrument drops on the floor in the course of the operation they are equally satisfied with the equally traditional 3 minutes. Now if 20 minutes are necessary the floor instrument will not be sterile; or if it is sterile 3 minutes' boiling is as effective as 20; but it is difficult to obtain the admission that what will cook the bacterial goose will also cook the bacterial gander. In any case, the Fuel Controller may have some influence on the question in the future.—I am, etc.,

G. H. STEELE, M.S., F.R.C.S.

Guildford.

Porphyrinuria in T.N.T. Poisoning

SIR,—From the 13 cases which formed the basis of our article (April 18, p. 490) some 200 specimens of urine were examined by the acetic acid–ether extraction technique and spectroscope. Porphyrins and porphyrin-like pigment, in varying amounts, were found in 151. During the earlier investigations it was found that a larger yield was obtained if the urine specimen was first boiled for not more than 1 minute with 20% sulphuric acid, and so this initial treatment was carried out in all subsequent examinations. It was noted, further, that this preliminary treatment liberated pigment and a precipitate in amounts which appeared to run more or less parallel with the depth of colour of the subsequent ethereal extract and the severity of the patient's clinical condition. And so, on these grounds, the suggestion was put forward that this simple preliminary treatment might be adopted as a "rapid clinical test" for porphyrinuria and toxicity in cases of T.N.T. poisoning.

It is rather difficult to reconcile Dr. C. Rimington's assertion (May 9, p. 594) that this simple boiling test of suspected urine with dilute sulphuric acid gives no indication of porphyrinuria with his previous recommendation (Dec. 16, 1939, p. 1173) that as a "simple urinary test" for porphyrinuria the urine should be heated at 100° C., when it will turn dark rapidly, and that "in routine examinations the urine be heated at 100° C. for half an hour before it is concluded that there is no gross porphyrinuria." We agree that this change is probably due to precursors of porphyrin and other porphyrin-like pigments, yet it is none the less an indication of crude or "gross" porphyrinuria.

The artificial addition of coproporphyrin to a specimen of urine may not, of necessity, reproduce the same conditions as obtain in the elaboration of porphyrin and porphyrin-like pigments under pathological conditions within the living body and their excretion. The porphyrins and porphyrin-like pigments and their precursors belong to a field of very specialized chemical research which, though limited in extent, is as yet incompletely explored.—We are, etc.,

A. M. KENNEDY.
JOHN INGHAM.

Cardiff.

Complacency in Anaesthetics?

SIR,—The letter of Dr. E. C. Atkinson (May 9, p. 595) with regard to the mortality rate under anaesthesia during the last 50 years calls for comment upon some of its observations and implications.

Surely when considering the question of mortality associated with anaesthesia it must be remembered that many surgical procedures commonplace to-day were dismissed as absolutely impracticable 50 years ago owing to the severe limitations imposed by the mask-and-bottle type of anaesthetic. To mention one example, pulmonary lobectomy would probably have proved fatal in almost every case attempted by the mask-and-bottle method. Indeed, with the simple Boyle machine, with all its easily seen bubbles, this operation might be attended by grave risk because of the lack of facility to use positive pressure to a regulated degree. This increase in surgical scope must be borne in mind when comparing anaesthetic mortality rates of 50 years ago with those to-day.

Dr. Atkinson would appear to have overlooked the fact that the term "complication" when applied to medical instruments is relative to the point in time at which these instruments are used, and also to the skill of the person called upon to use them. An anaesthetist working at the beginning of the time in question—i.e., 50 years ago—might have been struck with the same awe by the simple old Boyle machine as Dr. Atkinson appears to be by the modern McKesson. One believes that this latter excellent apparatus calls for no more mechanical observation of an anaesthetist fully accustomed to its use than the mask-and-bottle or the simple Boyle's apparatus require of him during the induction of anaesthesia.

It would be folly to agree that a student should in these days be allowed to qualify in complete ignorance of the mask-and-bottle technique. But surely if such a state of affairs can arise a direct request by a student for instruction in this art would arouse admiration on the part of the teacher, who would in most cases willingly deviate from normal routine in order to help the student who had shown enough interest to ask for the information. The unfortunate circumstances which surrounded Dr. Atkinson's anaesthetic training are by no means universal.—I am, etc.,

BASIL HILL.

Reading.

SIR,—In reply to Dr. E. C. Atkinson's letter on complacency in anaesthetics (May 9, p. 595), I can give him some of the information he seeks. I have collected records of a series of 8,000 general anaesthetics, divided into two groups, 1921 to 1925 and 1931 to 1935. In the earlier group all the cases received an anaesthetic on an open mask; in the later group 70% were anaesthetized with Boyle's apparatus. Deaths on the table in the first group amounted to 4.03 per 1,000; in the second group they were 2.3 per 1,000. The anaesthetic mortality has without doubt fallen still further during the last few years, although I have not yet collected a similar number of cases. The above series has been published in greater detail elsewhere. It must also be remembered that nowadays surgeons are a good deal more ambitious than they were twenty years ago.—I am, etc.,

MASSEY DAWKINS.

London, W.1.

SIR,—I had hoped that Boyle's apparatus was obsolescent. It has an uncomfortable habit of exploding from causes that are incompletely understood. When it explodes there is danger from blast from the explosion, there is often a sudden and obstinate fire, and there is danger from the generation of gaseous formaldehyde by incomplete ether combustion. Boyle's apparatus, therefore, includes in itself the potentialities of the H.E., the incendiary, and the gas bomb.—I am, etc.,

R. E. HOPE SIMPSON.

Beaminster, Dorset.

Treatment of Allergy

SIR,—Treatment with the patient's own blood serum (*Journal*, May 2, p. 552) was first recommended for allergic complaints in 1914 by Achard and Flandin (*Bull. Hôp. Paris*, 1914, p. 1222). It has since been used extensively in this country and in other countries, both in the form of autohaemo- and autosero-therapy. It is considered to be more efficient if the serum is as fresh as possible. The most common and simplest method used is to take the blood from the cubital vein and to inject it into the gluteal muscle before it is clotted or as citrated blood.

The idea is that it may work either as a mild unspecific protein therapy, avoiding the danger of anaphylactic reactions, or, as others believe, by its content of specific allergens (antigens). It is therefore claimed that small repeated doses of 10 to 12 injections of blood or serum given 2 to 3 times weekly produce better results than rarer injections of 10 to 30 c.cm. (Joltrain: *Rev. Méd.*, 1931, **48**, 267). Urbach (*Klinik u. Therapie d. Allerg. Krankh.*, Vienna, 1935, p. 378) is of the opinion that the method should be reserved for cases where an endogenous allergen has been proved as the probable cause and where for this reason the continuous presence of the allergen in the blood can be assumed. He recommends the injection of 1 c.cm. of the patient's serum every second day in 15 injections. Tuft (*Clinical Allergy*, Philadelphia and London, 1937, p. 111), on the other hand, recommends 5 to 10 c.cm. of blood or serum as the initial dose, which is increased in 2 to 7 days' intervals to 10 c.cm. of serum or 20 c.cm. of blood. He advises discontinuance of this treatment if favourable results are not obtained after the first few injections.

Although I admit that good results may be obtained in certain selected cases, it seems to me that in all allergic cases the extrinsic and intrinsic causes should be ascertained first before indiscriminate attempts at treatment are made. In all these conditions—asthma, hay fever, urticaria, etc.—the careful examination of the individual disposition and of allergic factors has the greatest value for the prophylaxis as well as for specific or symptomatic treatment. The most experienced workers in the field agree that so far the best results are obtaind by this procedure, including specific desensitization with the responsible allergens or their exclusion by prophylactic methods.—I am, etc.,

Buxton. E. M. FRAENKEL.

War Neurosis—An Error Corrected

SIR,—I am writing to correct an error of fact in my letter published in your number of March 28 (p. 421). It was there stated that of 332 men sent back to duty only 38, or 11%, had later been boarded out of the Army. This was contrasted with a 40% relapse rate in Major Hadfield's material. Unfortunately my facts were not correct, the error being caused by a mistake in the titling of two tables. The 11% referred to men who had subsequently been on light duty; and actually the number of men with a bad follow-up—i.e., invalided out or inefficient on return to normal (not annexure) duties—was 140 out of a total of 301—i.e., 46.5%. Our figures are therefore no better than those of the 41st General Hospital, indeed slightly (though probably not significantly) worse.

I particularly regret this error, as it has caused Major Hadfield to devote considerable space in his reply to dealing with it, when it was not important to the main points raised by my letter. As he says, comparisons in such respects are rather illusory. The point I was endeavouring to make was that both sets of figures, from the 41st General Hospital and from this hospital, are unsatisfactory and discouraging if the "neurotic" is regarded as a man who requires only some psychotherapy to be as good as his fellows.—I am, etc.,

Sutton, Surrey. ELIOT SLATER.

"Handbook of Ophthalmology"

SIR,—Your reviewer of *A Handbook of Ophthalmology*, by Humphrey Neame and F. A. Williamson-Noble (April 11, p. 467), is, we feel bound to say, both inaccurate and hypercritical. Admittedly a lengthy description of the operation of intracapsular extraction of cataract as given in the chapter on tropical ophthalmology is outside the student's sphere, but this chapter was designed to make the book of greater use to practitioners in the Tropics.

On the other hand your reviewer would have the student filled up with more detail about the uses of vitamin B_2 in ophthalmology, and states: "The value of vitamin B_2 in corneal lesions is . . . ignored." The fact that vitamin B_2 has been reported as being in use for a variety of corneal conditions does not *prove* that it is of use in those conditions. The cautious reference made to its use in rosacea keratitis on p. 131 seems to have escaped his notice.—We are, etc.,

F. A. WILLIAMSON-NOBLE.
London, W.1. HUMPHREY NEAME.

Intravaginal Packs

SIR,—I wish to associate myself with Drs. Brander, Cardwell, Rowstron, and Connolly in their various misgivings about intravaginal "sanitary" packs and to add yet another note of warning. In her article (April 25, p. 524) Dr. Mary Barton says "cervicitis and vaginitis might possibly occur as a result of local irritation," but dismisses the risk as of little importance if reputable brands of appliances are used. I do not feel this serious disadvantage can be so lightly dismissed. I have seen two cases of fulminating vaginitis with partial sloughing of the mucosa directly following a first use of intravaginal packs. I have also seen many cases, more particularly in virgins, of vaginal soreness and discharge following the use of these packs. A high proportion of these cases show infection with a mould which is often extremely difficult to eradicate. It seems possible that some of the less adequately sterilized packs on the market may harbour moulds; I am at present attempting to collect evidence on this point. Meanwhile may one ask how the public is to distinguish between reputable and disreputable brands of vaginal packs?—I am, etc.,

Crediton, Devon. MARGARET HADLEY JACKSON.

SIR,—From the purely feminine point of view there are so many reasons against the use of internal sanitary appliances that it is not easy to see how any woman, being also a doctor, could advise their use. The question falls under two heads—namely, the medical aspect and the indefinable feminine sense of what is becoming. In the matter of the former, we can dilate on the anatomical, mechanical, sartorial, physiological, pathological, psychological, and other details. It is to be doubted if the answer to the latter, of which every woman recognizes the overriding importance, can be supplied by medical science.—I am, etc.,

London, N.10. ELIZABETH M. PRINGLE.

Medical Certification in Industry

SIR,—Dr. Kefalas raised some interesting points about certification in the *Journal* of April 25, which has just come to my notice. As a general practitioner I do not see eye to eye with him, especially when he says "doctors are continually finding themselves bound, both by the law and by the best traditions of their craft, to issue certificates which they feel they ought not to have to issue." I think that much of the trouble over certification comes from the failure, on the part of the certifier, to keep a clear view of his precise function. May I outline the view, and attitude, which seem to me correct.

Let every doctor think of himself, where certification is concerned, as an expert witness. He may be asked for two kinds of information—namely, facts and opinions. He should refuse neither, assuming that he is satisfied with the conditions under which they are given. At the same time, no patient is entitled to ask him to certify what is not a fact, or to express an opinion exposing him to ridicule or opprobrium. He can insist that his certificates must be both true and sensible. Very well. He now enters the maelstrom of certification with these principles clearly in mind, determined to "stick to his point." What happens?

Mr. A has chronic bronchitis and says (taking the example from Dr. Kefalas) that he is unfit for grinding small tools because of the dust entailed in the operation. Is he suffering from chronic bronchitis? Yes. Is a dusty atmosphere prejudicial to his health? Yes. Then his doctor can answer both questions. Is dust entailed in small-tool grinding? His doctor knows nothing about small-tool grinding and therefore says nothing about it. Certificate: This certifies my opinion that Mr. A is suffering from chronic bronchitis and that a dusty atmosphere is prejudicial to his health. "But what about the tool grinding?" asks Mr. A. That is a technical matter to be settled with the firm. The doctor has fulfilled his role of expert

witness. His duty is done. He is an expert witness on disease, not on tool grinding.

This may all sound like trying to make the matter too simple, but I sincerely believe it is not. It is simply a question of seeing a point and sticking to it. Moreover, all questions of certification can be resolved into the same general terms. The doctor can certify facts and opinions about health. He can certify their implications for the guidance of the laity just as he does for the guidance of the Bench in court. But how far these implications operate in regions outside his knowledge is no concern of his, and certainly no responsibility in law. Forgive me, Sir, for having been a little tedious in hammering my points, but I feel that if they were more widely grasped there would be less trouble with certification, at all events on the practitioner's side.—I am, etc.,

Liverpool. C. H. ROSS CARMICHAEL, M.B., Ch.B.

SIR,—I have read with interest the article by Dr. A. Kefalas on medical certification in industry (April 25, p. 531). He writes: "The mere fact that the patient is ill, or even claims to be ill, makes it incumbent upon the general practitioner to neglect no possible precaution whatever, for if he does so neglect any precaution he is plainly guilty of culpable negligence. He has perforce to take the view that the process might be dangerous, and therefore has to cover the contingency, for the simple reason that if it were not so covered and the patient came to any harm, or could convince a court of law that he had suffered harm (not always the same thing!), the doctor could be mulcted in damages and injured in reputation." I should be glad to hear what the legal advisers of the medical protection societies say of the above. It does not seem in accordance with the notice issued by the General Medical Council some time ago. The words I take exception to are, "claims to be ill." Further on Dr. Kefalas italicizes the word "might."

On Good Friday morning a young man from Wales came into my surgery; he wished to be entered on my panel. He then told me a sad tale of headaches, and ascribed them to his work. He wanted "a sixpenny note" to get back to his mountain fastness; he did not get it. Next morning his wife came requesting the return of his medical card, explaining that he had come to the wrong doctor. I did not feel "bound by the law" to issue a certificate. Possibly a colleague acted in accordance with the best traditions of the craft and gave a certificate.

Last week I saw a young girl with scabies. She had been told that she had probably caught it at the laundry where she was employed. She wanted a note to say that she might get it again and recommending change of work. Can she get damages from me if she ever does contract this troublesome complaint?

A few months ago a man wanted a note advising that he should have extra petrol to take his wife shopping as she had a bad leg. In spite of his citing as a precedent that he had got a note in London, I refused. If his wife ruptures a varicose vein while shopping am I liable to be mulcted?—I am, etc.,

Smethwick. G. J. JONES.

Preserving the Race

SIR,—A fatal attack of disease is often but an exacerbation of a chronic condition which preceded it, and which can, therefore, be reckoned its essential cause. I have long held that the dissolution of Western civilization now in rapid progress was caused essentially by such chronically acting factors as birth prevention and bureaucracy (the latter, like the former, being a stultification of life). The sexual promiscuity which begins to be condoned, if not favoured, seems to me to belong to the same class of activities as the indiscriminate bombing now considered so "realistic," and therefore so practical a measure in international politics. Those who advocate unchastity—with, of course, State care of any children which happen from time to time to result from it—turn a blind eye to the obvious fact that the family is the natural foundation of social life, and also forget that among savages and apes in their "uncivilized" condition the sexual functions are strictly regulated by code. The present reversionary trend may, of course, come to a halt at the anthropoid stage, but Mr. H. G. Wells is by no means unjustified in his apprehensions that all traces of mankind ever having existed may quite well become lost.—I am, etc.,

North Queensferry, Fife. A. J. BROCK.

Obituary

H. RUSSELL ANDREWS, M.D.
F.R.C.P., F.R.C.O.G.

The news of the death of Dr. Russell Andrews, which took place on May 1 at Iford, near Lewes, will be received with regret by the many who recall him as one of the foremost figures in consulting obstetrical and gynaecological practice in London.

Henry Russell Andrews, whose father was vicar of Highgate, was born in London just over seventy years ago. He was educated at Merchant Taylors' School, and received his medical training at the London Hospital, supplementing it by visits to the clinics of Berlin and Vienna. He qualified in 1894, took the M.D. of London University in 1896, the M.R.C.P. in 1900, and was elected F.R.C.P. in 1913. His long career as an obstetric physician was closely associated with the London Hospital. It was there he held his first posts as house-physician and resident accoucheur, and for many years he was a member of the "London" staff, becoming eventually senior obstetric physician and, after his retirement, consulting physician. He was also consultant to the East End Mothers' Home and certain local hospitals.

His ability in the obstetric field came to be widely recognized, and at various times from 1912 onwards he was examiner in this subject to the Universities of Oxford, Cambridge, Durham, and London, the Conjoint Board, and the Society of Apothecaries. He was one of the original members of the British (now the Royal) College of Obstetricians and Gynaecologists, and in 1933 was elected vice-president of that body. He also filled the chair of the Section of Obstetrics and Gynaecology of the Royal Society of Medicine. When the fifth British Congress of Obstetrics and Gynaecology was held in London in 1925 Russell Andrews was chosen as its president. He also presided over a committee of the Royal Society of Medicine which considered the subject of prevention of puerperal sepsis. This was at a time when the statistics of maternal mortality and morbidity were gravely disquieting. Russell Andrews's own view was very simple—namely, that in closer and better ante-natal supervision lay the chief hope of prevention. He attached great importance also to the education of the midwife. His best-known book was his *Midwifery for Nurses*, written in collaboration with Mr. Victor Lack. The eighth edition was published just before the present war. He was one of the "Ten Teachers" who contributed to a volume on *Midwifery* in 1916 and on *Diseases of Women* in 1919. He also wrote some of the articles in Latham and English's *System of Treatment*, and was editor, with Sir Comyns Berkeley and Dr. J. S. Fairbairn, of another textbook on gynaecology. In 1915 he delivered the Hunterian Society's oration, taking as his subject the work of William Hunter in midwifery.

Russell Andrews joined the British Medical Association in 1900. In 1907 he was secretary of the Section of Obstetrics and Gynaecology and vice-president of the Section in 1922. In 1925 he contributed to the Annual Meeting of the Association a noteworthy paper on "Backward Displacements of the Uterus." He gave up his London practice in 1927 and retired into the country. A gathering of 28 well-known London obstetricians and gynaecologists at a farewell dinner voiced their affection for him. He was a man who evoked affection, alike in his West End consulting practice and among poor East End mothers. In the year of his retirement he delivered to the Chelsea Clinical Society a valedictory address entitled "Professional Regrets."

H. B. GRIMSDALE, F.R.C.S.

Mr. Harold Barr Grimsdale, consulting ophthalmic surgeon to St. George's Hospital, and consulting surgeon to the Royal Westminster Ophthalmic Hospital, died at Hindhead on May 5. He was born at Liverpool in 1866, the fourth son of Thomas F. Grimsdale, M.D., and from Winchester entered Gonville and Caius College, Cambridge, with an exhibition. After graduating B.A. in 1888 he went on to St. George's Hospital, and took the M.B., B.Ch. degrees in 1892 and the F.R.C.S. diploma in 1894. At St. George's he had been house-surgeon and assistant

to the ophthalmic surgeon. After that he served as chief clinical assistant at Moorfields and was elected to the visiting staff of the Royal Westminster Ophthalmic Hospital. He became ophthalmic surgeon to St. George's in 1906, and for many years gave the benefit of his great experience in eye work to the Governesses' Benevolent Institution, the Artists' Annuity Fund, and the Royal Normal College for the Blind at Norwood. During the last war he was honorary consulting ophthalmic surgeon to military hospitals in London, and served on the Departmental Committee on the Condition of the Blind, 1914–17. Mr. Grimsdale published lectures on the nursing of diseases of the eye and on the correction of errors of refraction; he was also joint author with Mr. Elmore Brewerton of a *Textbook of Ophthalmic Operations*, which reached its third edition in 1937.

The Services

The M.C. has been awarded to Capt. J. S. H. Wade, R.A.M.C., in recognition of gallant and distinguished services in the Middle East.

CASUALTIES IN THE MEDICAL SERVICES

Surg. Lieut.-Cmdr. SAMUEL KINGSLEY FOSTER, R.N., who died in hospital in Edinburgh on May 10, qualified M.R.C.S., L.R.C.P. in 1929 and in the same year took the degrees of M.B., B.Ch. of the University of Leeds. He entered the Royal Navy as surg. lieut. in 1931 and was promoted in 1937. He leaves a widow.

Surg. Lieut. ADRIAN MICHAEL BARRY, R.N.V.R., who is reported missing, presumed killed on active service, was the eldest and last surviving son of Mr. and Mrs. R. A. Barry of Fransch Hoek, Cape. He was born on October 2, 1911, graduated M.B., B.Chir. at the University of Cambridge in 1937, and was awarded the Walter Dixon Scholarship by the Council of the B.M.A. in the following year. He entered the R.N.V.R. in September, 1939.

Surg. Lieut. CHARRINGTON CECIL KIRBY, R.N.V.R., is reported missing, presumed killed, as the result of the loss of H.M.S. *Cornwall*. He was born on Dec. 17, 1912, the only son of Mr. and Mrs. T. C. Kirby of Pinner and Upper Woodford, Salisbury, and received his professional education at St. Mary's Hospital, qualifying M.R.C.S., L.R.C.P. in 1937 and taking the M.B., B.S. of the University of London in the following year. After holding house appointments at St. Mary's he was in practice at Pinner before entering the R.N.V.R. in Jan., 1940. He was a member of the B.M.A.

Lieut.-Col. COLIN CHARLES GORDON GIBSON, R.A.M.C., died on active service in April. He was born in 1892 and received his professional education at Guy's Hospital, qualifying M.R.C.S., L.R.C.P. in 1915. He served in the war of 1914-18 in France until he was taken prisoner in March, 1918. Soon after he was repatriated he relinquished his temporary commission, but re-entered the R.A.M.C. with a regular commission in 1920, was promoted major in 1928, and recently became lieut.-col.

Capt. LAURENCE PERCIVAL FITCH, late R.A.M.C., who died on May 11, aged 34, was the youngest son of the late Mr. and Mrs. H. A. Fitch of Hastings, and qualified M.R.C.S., L.R.C.P. in 1932. After brief periods at Hastings and Newport, Mon., he was in practice at Croydon until June, 1940, when he entered the R.A.M.C. at temp. lieut. He was promoted in 1941, but relinquished his commission in March this year on account of ill-health.

War Substantive Capt. HENRY THORPE STEWART, R.A.M.C., is included as "Died" in an Army Council Casualty List published on May 13. He was educated at Queen's University, Belfast, and graduated M.B., B.Ch., B.A.O. in 1939. After holding the post of house-physician and casualty officer at Stockton and Thornaby Hospital he entered the R.A.M.C. as temp. lieut. in Feb., 1940, and was promoted a year later. He was a member of the B.M.A.

Flight Lieut. WILLIAM JOHN CARLYON ANSTIE was killed on active service in Ceylon in April, aged 31. He was born on Aug. 12, 1910, the elder son of the late W. H. Anstie and Mrs. Anstie of Baughurst, Hants, and was educated at the University of Oxford and St. Thomas's Hospital, graduating B.A. in 1932 and B.M., B.Ch. in 1935. After filling house appointments at St. Thomas's he settled in practice in London, entered the R.A.F. as flying officer in October, 1939, and was promoted flight lieut. a year later.

Missing.—Surg. Lieut. S. W. Pratt, R.N.V.R.

Universities and Colleges

UNIVERSITY OF OXFORD

The special examination for the Radcliffe Scholarship in Pharmacology, 1942, will be held in Oxford on Tuesday, July 7, at 10 a.m. (*Change of date.*)

UNIVERSITY OF SHEFFIELD

At a meeting of University Council, held on May 8, it was announced that Sir Arthur Hall had presented a complete set of the *Proceedings of the Royal Society of Medicine* to the University library, and lantern slides, documents, and photographs to the Faculty of Medicine. The Council expressed its warm thanks to Sir Arthur for his gifts.

SOCIETY OF APOTHECARIES OF LONDON

At a meeting of the Private Court held on May 12, with Sir Stanley Woodwark, Master, in the chair and the wardens, Dr. F. Gymer Parsons and Mr. V. Warren Low, in attendance, the date for the delivery of the third Strickland Goodall Lecture, by Dr. William Evans, was fixed for Wednesday, June 24, to be given in the Hall at 5 p.m.

Mr. L. Vernon Cargill was appointed to represent the Society at a meeting of Minor City Companies in connexion with war damage and kindred matters. William David Williams, Licentiate, was clothed with the Livery; Dr. George Edgar Septimus Ward, an Examiner in Medicine to the Society, Basil Lyndon Steele, Licentiate, Russell Vyvyan Steele, Harold Christopher Simpson, Licentiate, and John Douglas Robertson were admitted to the Freedom of the Society.

Medical Notes in Parliament

Alcohol Poisoning

On May 12 Major LLOYD asked the Secretary of State for Scotland whether he had any statement to make with regard to the recent deaths from alcohol poisoning in Scotland; and if the source of the alcohol had been discovered. Mr. JOHNSTON said that the Lord Advocate was directing a public inquiry to be held under Section 3 of the Fatal Accidents and Sudden Deaths Inquiry (Scotland) Act, 1906. In these circumstances he (Mr. Johston) was unable to make any statement on the subject at present.

Answering an inquiry on May 13 by Lord Teviot, the DUKE OF DEVONSHIRE said in the House of Lords that neither wood alcohol nor its synthetic equivalent, methanol, was being manufactured for sale for drinking. The small quantities known to have been consumed were manufactured for commercial or chemical purposes and were obtained by theft. Two deaths had recently been due to consumption of methyl alcohol or methanol. Two seamen in London died from home-made wine fortified with methanol stolen from the docks. In Glasgow some dozen persons died from drinking stolen spirit. The Board of Customs and Excise and the police were exercising vigilance.

Quinine Supplies

Mr. HAROLD MACMILLAN informed Mr. de Rothschild on May 13 that steps were being taken to increase the production of quinine in the Colonies. For technical reasons these did not at present include development in the West Indies. Mr. DE ROTHSCHILD advocated a revival of the cultivation of cinchona in Trinidad. He remarked that this had been extensive for many years. Mr. MACMILLAN said he would look further into that. He told Sir Francis Fremantle that he would rather not say in public what steps were being taken to secure supplies of atebrin or other effective substitutes for quinine.

Investigation of Scabies

Replying on May 14 to Mr. Cecil Wilson, Mr. ERNEST BROWN said the investigation of scabies by Dr. Kenneth Mellanby had begun at his instance, but was being continued under the auspices of the Medical Research Council. Its object had been to obtain more knowledge of the parasite, the means by which scabies spread, and the best methods of treatment. For this the services of human volunteers were essential. Forty-seven volunteers had been infected. They remained under examination for varying periods up to 18 months. The investigation was still in progress, but preliminary results were found in the White Paper now available regarding scabies. Of the volunteers infected the majority, and all of those infected for more than one week, were conscientious objectors; none of them had been directed to this duty by a tribunal, though some who were

already engaged in it when they went before a tribunal were exempted from military service on condition that they continued in the work or took up first-aid duties. They had suffered discomfort rather than danger, but had not been free from risk of incurring some prolonged disability. He had no doubt that the work would have valuable results.

Increase of Tuberculosis in Mental Hospitals

Mr. PARKER inquired on May 14 what action Mr. Brown proposed to control the increase of tuberculosis in mental hospitals. Mr. BROWN replied that the problem was being dealt with partly by bringing back into use verandas for sleeping which had not been available owing to air-raid dangers. A committee of the Medical Research Council was examining the increase among mental patients, and expected soon to submit an interim report.

Condensed Milk for Infants.—Major LLOYD GEORGE announced on May 13 that a permit granting additional "points" for the purchase of condensed milk would be issued by a local food office on presentation of a medical certificate in the case of a premature infant not exceeding the age of 6 months. He added that in consultation with the medical advisers of the Ministry of Food Lord Woolton was considering the possibility of making arrangements for the supply of condensed milk, without the surrender of points, in cases where this type of processed milk was essential on medical grounds. Any such concession would be limited to infants under 1 year old.

Salaries of Midwives.—On May 14 Mr. ERNEST BROWN said the terms of reference of the committee on the salaries of midwives were: "To draw up agreed scales of salaries and emoluments of State-certified midwives employed in England and Wales on maternity work in hospitals or maternity homes or in the domiciliary midwifery service, of non-medical supervisors of midwives, and of pupil midwives." Mr. Brown added that he would ask this committee to consult with the Nurses' Salaries Committee before making recommendations on overlapping matters.

EPIDEMIOLOGICAL NOTES

Discussion of Table

In *England and Wales* during the week there was, with the exception of measles, a general decline in the incidence of infectious diseases. The 4,006 notifications of measles were 504 more than the total for the previous week, when a decrease of 585, the first fall in the incidence for three months, was recorded. The counties with the largest rises were Middlesex and Lancashire, with 238 and 139 additional cases. The chief centres of infection were Middlesex (Harrow U.D. 151, Heston and Isleworth M.B. 92, Ruislip-Northwood U.D. 130) and Lancashire (Manchester C.B. 248, Liverpool C.B. 120). In London, Surrey, Dorset, Essex, Warwickshire, and Yorks West Riding the totals were 42, 36, 35, 25, 35, and 35 in excess of the number notified in the preceding week. In Kent, Durham, and Northumberland 61, 43, and 89 fewer cases were reported.

Although there were 49 fewer cases of whooping-cough for the whole country, the only area with a marked decrease in incidence was Yorks West Riding, where the notifications fell by 100 cases. The counties with the largest increases were Essex, Lancashire, and Middlesex, with 19, 14, and 26 more cases than in the preceding week.

The notifications of dysentery, 160, showed a decline of 25. There were no fresh local outbreaks of any size, the largest being in Norfolk, Norwich C.B. 6. In districts where the disease was already prevalent 12 more were recorded in Middlesex, Southall M.B., 23 in Leicestershire, Leicester C.B., and 32 in Yorks West Riding, Bradford C.B.

In *Scotland* there was a slight rise in the incidence of infectious diseases. Measles decreased by 54 cases. The epidemic in Glasgow fell from 400 cases to 334, but that in Edinburgh rose from 77 to 156.

There were 52 cases of cerebrospinal fever. The relatively large increase of 20 cases on the total of the preceding week was fairly widely distributed, the largest totals being those of Glasgow 15, and the town of Motherwell and Wishaw 7.

In *Eire* an increase of 21 cases of measles was reported. The principal centres of infection were Dublin 89 cases, and Westmeath, Mullingar R.D. 37 cases.

In *Northern Ireland* there was a big rise in the figure for measles. The numbers of cases in Belfast for the past four weeks were 29, 57, 75, and 133.

Returns for the Week Ending May 9

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,145, whooping-cough 1,641, diphtheria 713, measles 4,725, acute pneumonia 1,096, cerebrospinal fever 149, dysentery 101, paratyphoid 7, typhoid 12.

No. 17

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended May 2.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1942 (a)	(b)	(c)	(d)	(e)	1941 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	149	5	52	1	6	309	22	97	4	9
Deaths		3	—				2	5		
Diphtheria	743	39	185	42	20	912	40	213	23	26
Deaths	17	1	1	3	1	27	1	4	3	2
Dysentery	160	15	42	1	—	106	18	63		—
Deaths			—	—	—			—	—	—
Encephalitis lethargica, acute	3	—	—	—	—	6	1	1	1	—
Deaths		—	—	—			1	—	—	
Enteric (typhoid and paratyphoid) fever						26	—	75	5	—
Deaths						1	—	—	—	—
Erysipelas			36	12	2			54	8	4
Deaths		—	—				—	—		
Infective enteritis or diarrhoea under 2 years				44						
Deaths	30	2	3	14	4	31	5	8	8	1
Measles	4,006	339	562	159	133	13,883	423	126		4
Deaths	6	—	2	2	1	10	2	—	—	—
Ophthalmia neonatorum	100	4	27		—	81	3	12		—
Deaths										
Paratyphoid fever	13	1	2		—					
Deaths	1	—	—		—					
Pneumonia, influenzal*	813	28	13	4	6	1,095	48	16	9	3
Deaths (from influenza)	22	—	2	—	—	37	2	1	1	—
Pneumonia, primary			306	17				260	12	
Deaths		—		10	19		—		11	11
Polio-encephalitis, acute	—	—				2	1			
Deaths		—					—			
Poliomyelitis, acute	5	—	1	2	—	6	—	3		—
Deaths		—	—				—	—		
Puerperal fever	—	1	11	1	—	2	2	15	1	—
Deaths		—					—			
Puerperal pyrexia	147	6	29		1	121	3	15		4
Deaths										
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,005	38	165	57	16	1,021	—	117	47	25
Deaths	3	—	1	1	—	1	4	—	—	—
Small-pox	—	—	—		—	—	—	—		—
Deaths	—	—	—	—	—	—	—	—	—	
Typhoid fever	10	3	1	10	—					
Deaths	2	—	1	—	—					
Typhus fever	—	—	—	—	—	—	—	—	1	—
Deaths			—	—	—			—	—	—
Whooping-cough	1,623	194	115	34	13	4,187	114	549		7
Deaths	11	2	1	7	—	32	2	18	1	—
Deaths (0–1 year)	339	32	75	37	29	387	32	83	27	23
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	4,621	557	640	206	125	6,770	1,798	698	208	493
Annual death rate (per 1,000 persons living)			14·4	13·8	†			15·2	13·8	43·2
Live births	6,312	653	965	363	313	5,258	398	914	390	237
Annual rate per 1,000 persons living			20·0	24·2	†			18·6	25·9	20·8
Stillbirths	222	20	43			209	13	30		
Rate per 1,000 total births (including stillborn)			43					32		

* Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

† Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.

Medical News

The annual session for 1942 of the American Medical Association will be held at Atlantic City in the week June 8–12. In an editorial discussing the plans for this meeting the *Journal of the American Medical Association* says that long before the United States entered the war the authorities of the A.M.A. had agreed to endeavour to make it an inter-American meeting, as an indication of the close relationship in medicine prevailing among all the American nations. The Brazilian Government has offered exhibits dealing particularly with yellow fever and malaria, and, subject to the difficulties of travel in wartime, there is promise of the attendance of some of the leading figures in medicine in South America, Canada, the West Indies, Mexico, and Central America. Several events of special interest in relation to the war are being scheduled, and official representatives of Governmental agencies concerned with medical participation in the war have undertaken to be present and to contribute to the programme.

In connexion with the Manchester nursing recruitment campaign an exhibition was held from May 4 to 16 to illustrate the development of nursing and the training and work of the nurse. The Minister of Health opened the exhibition under the chairmanship of the Lord Mayor of Manchester. Practical nursing demonstrations were given daily at the Royal Infirmary and other hospitals. The campaign was organized by the Manchester Public Health Department two months ago

The American Association of Public Health, at its recent meeting in Atlantic City, awarded the Sedgwick Memorial Medal for distinguished service in public health to Dr. Charles Armstrong of the Public Health Service of the United States, and in particular for his studies on encephalitis, psittacosis, and poliomyelitis.

Tributes to the work of Dr. Robert Douglas, who has retired from the post of medical officer of health for Moray and Nairn after 31 years' service, were paid at a recent meeting of the Joint County Council.

A malaria survey of the Island of Trinidad has recently been undertaken by Drs. Mark F. Boyd and W. G. Davis of the Rockefeller Foundation.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1.

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QUERIES AND ANSWERS

Sharpening Blades

Mr. E. G. POWER writes in reply to P. K.: Procure a piece of aluminium, say, 1 in. wide and 6 in. long (not foil), and fasten it to a piece of wood. The surface can be made perfectly smooth and bright. The razor or knife after being sharpened in the ordinary way may then be finished off on the aluminium. A rotary motion may be used in the same way as upon a hone.

Income Tax

Residence in Colony

" M.D." inquires (1) whether a ship surgeon travelling between South Africa and England who elected to have his salary paid in South Africa would be liable to United Kingdom income tax, and (2) what would be the position, if he were appointed to the Imperial service while residing in South Africa, as regards a colonial pension and private income from this country.

*** It is assumed that there would be no residential connexion with the United Kingdom. (1) He would be liable only in respect of that portion of the income earned while in the United Kingdom —probably assumed to be *nil* by the authorities. (2) The colonial pension would not be liable to United Kingdom income tax as it was earned during service abroad, but the income from private investments would be liable. If tax thereon were also charged by the South African Government, Dominion income-tax relief would, however, be due.

LETTERS, NOTES, ETC.

Scabies

Dr. J. STAVELEY DICK (Manchester) writes: May I repeat that, while finding the *Acarus scabiei* is often of decisive importance in making a positive diagnosis, failure to find the acarus, on the other hand, cannot be taken as decisive of its absence from a doubtful lesion, nor can it be taken as decisive evidence of cure. The decisive value of a positive and comparatively small value of a negative finding would, I think, be accepted by competent observers in other infective diseases also. That is, at all events, my position. Dr. H. Lyndhurst Duke, however, says (April 18, p. 510) that my position in this matter is " manifestly absurd." But if so, why take the trouble to point it out? If it is " manifestly "—that is to say, clearly, self-evidently—absurd, that is the end of it. Judging by his letter Dr. Duke has a tendency to extravagant language. He saw parasites which were " fat and feebly protesting mites." The *Acarus scabiei* is, according to some textbooks, " barely visible to the naked eye." How he came to recognize that they were fat and that their feeble movements indicated protest is not manifest from the context. However, scientific discussions are sometimes a little dull owing to the extreme precision of language usually aimed at. I do not, therefore, seriously complain of an occasional lapse into the melodramatic. But I think one must draw the line when Dr. Duke proposes to widen the connotation of that useful technical term " carrier." He asks, " Are carriers not just cases of scabies? " If we have " carriers " in scabies, as seems not improbable, then the answer is that they are *not* just cases of scabies. May I in conclusion say that I had not the remotest intention of depreciating in any way the very valuable work, by all reports, which is being done by Dr. Mellanby at Sheffield. I may also add that I did not feel in the least annoyed by Dr. Duke's vigorous criticism, and I hope he will regard mine as a reasonably fair rejoinder.

Treatment of Fractured Ribs

Dr. J. V. REUBEN (Bradford) writes: The point raised by Dr. G. Llewellyn Davies on the strapping of fractured ribs (April 18, p. 509) is one which has caused me some concern for a number of years. Every first-aider is taught that there are two types of rib fracture—the first by indirect violence, where the ends of bone point outwards; the second by direct violence, where the ends of the bone are pushed in and where there may be the complication of a damaged lung. The first type he is recommended to bandage tightly. In the second type tight bandaging is forbidden. Yet I find that every case of fractured rib treated at hospitals is strapped. In some cases I have had to remove this strapping because of the extra pain. Perhaps a perusal of the manual of first aid issued by the St. John Ambulance Association might be of value to casualty surgeons. I have found it an extremely valuable little book.

What is a " Truby King Baby " ?

Dr. BARBARA R. A. DEMAINE (Rotherham) writes: I was pleased to read the letter of Dr. John Thwaites on the Truby King methods (May 9, p. 595). Twenty years ago I was privileged to work at the London Training Centre, and the principles learnt there have been invaluable in carrying out child welfare work. It gives a definite plan to work on, and one which appeals to most mothers because they can understand it and can co-operate with the medical adviser. I think we should go even further in training in mothercraft, and urge for its inclusion in the education of senior girls during their last year at school.

Argyll Robertson's Pupils

Dr. Alexander W. Stirling, reminiscing about European ophthalmologists of the last century (*Arch. Ophthal.*, Chicago, 1941, **26**, 727) and referring to the handsome and striking appearance of Douglas Argyll Robertson, writes: " It is related of a cousin of mine that she paid her 2 guineas not so much that Argyll Robertson should examine her eyes as that she might gaze into his."

Corrigendum

Drs. Neil MacLeod and L. A. Schnipelsky wish to correct an obvious error which appeared in their memorandum on " Cardiac Massage for Heart Failure under Spinal Anaesthesia " (*Journal*, May 16, p. 610). At line 19 of the case report the sentence should continue: ". . . while the anaesthetist kept the airway clear and administered CO_2 and oxygen *intratracheally* "—not intrathecally.